

26 November 2020

Waikato District Council
Attention: Milan Covic
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Gray Matter Ltd
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17_147

Dear Milan

68-72 GREAT SOUTH ROAD, POKENO – TRANSPORT PEER REVIEW ADDENDUM

1. Background and Purpose

This letter provides an addendum to update our previous peer review (refer Appendix 1: Peer Review letter to Milan Covic, Gray Matter, Issue 1, July 2020) with respect to the proposed upgrade of the intersection of Pokeno Road and Great South Road to traffic signal control.

We are informed by Waikato District Council that the proposed intersection improvements are likely to include a raised median island and altered kerb alignments along Great South Road in front of Gull's proposed site (refer Appendix 2: Intersection Schematic Drawings, WSP, 9 October 2020). The timing of the proposed intersection improvements has not been confirmed.

This addendum includes an assessment of the likely traffic and transportation aspects of the Applicant's proposal for a petrol station at 72 Great South Road, as affected by the proposed intersection improvements.

The Applicant has not provided information to show how the proposed site could operate in conjunction with the proposed intersection improvements.

The comments in this addendum refer to the updated site plans Resource Consent Application Issue – 13-11-2020 (Technitrades Architecture, 13 November 2020).

This addendum is intended to be read in conjunction with our peer review.

2. Aspects Covered in this Addendum

This addendum includes the following items:

- = Updated assessment of sight distance at the proposed vehicle crossings;
- = Changes to site access due to raised median island;
- = Changes to manoeuvring space due to changes in site layout;
- = Changes to landscaping requirements due to altered sight distance;
- = Changes to vehicle crossing surfacing;
- = Updated assessment of effects;
- = Updated required mitigation; and
- = Updated conclusions.

We have assessed the site against the requirements of the Proposed District Plan (PDP) and the Franklin Section of the Operative District Plan (ODP).

2.1. Sight Distance

Our comments in this section are based on the following parameters:

- = Vehicle crossing A is entry only;
- = Vehicle crossing B is exit only; and
- = 105m required sight distance (as per PDP Table 14.12.5.3, for a 60km/h speed environment).

2.1.1. Vehicle Crossing A

For vehicles entering crossing A (Entry), the central raised median will prohibit right turns into the site. A vehicle turning left into the site will be visible by following traffic and the likelihood of vehicle-vehicle collisions is low.

2.1.2. Vehicle Crossing B

In our peer review (Appendix 1), we commented in Section 4.3.3 Sight Distance: *“If the Pokeno Road intersection is upgraded and the berm width outside 72 Great South Road is reduced... the sight distance from the proposed vehicle crossings is likely to be negatively affected due to the driver being positioned further back into the site when checking for approaching vehicles.”*

Figure 1 shows the approximate driver eye position and extent of the required 105m sight distance to the north (right) from crossing B (Exit).

As shown, the driver's line of sight passes across the north/Church Street boundary of the site (approximately 14-15m back from the frontage with Great South Road) and the adjacent property at 80 Great South Road to a greater extent than previously identified.

As noted in our peer review (Appendix 1): *“Crossing B does not have the required 105m of unobstructed sight distance to the north, relocating the fence at 80 Great South Road would improve the sight distance to approximately 90-100m which is considered acceptable for a 50km/h speed environment. [Stopping sight distance] SSD of 73m is achieved for this crossing.”*

Whilst the changed driver eye position maintains SSD of 73m, there appears to be greater reduction in sight distance to the north. We estimate the available sight distance would be less than 90m. For a more conclusive assessment of sight distance and visibility requirements, we suggest the Applicant provide updated site plans that include the WSP design for the signalised intersection.

The effect of a shortfall in sight distance of 15m or more is an increase in likelihood of increased severity of a crash.

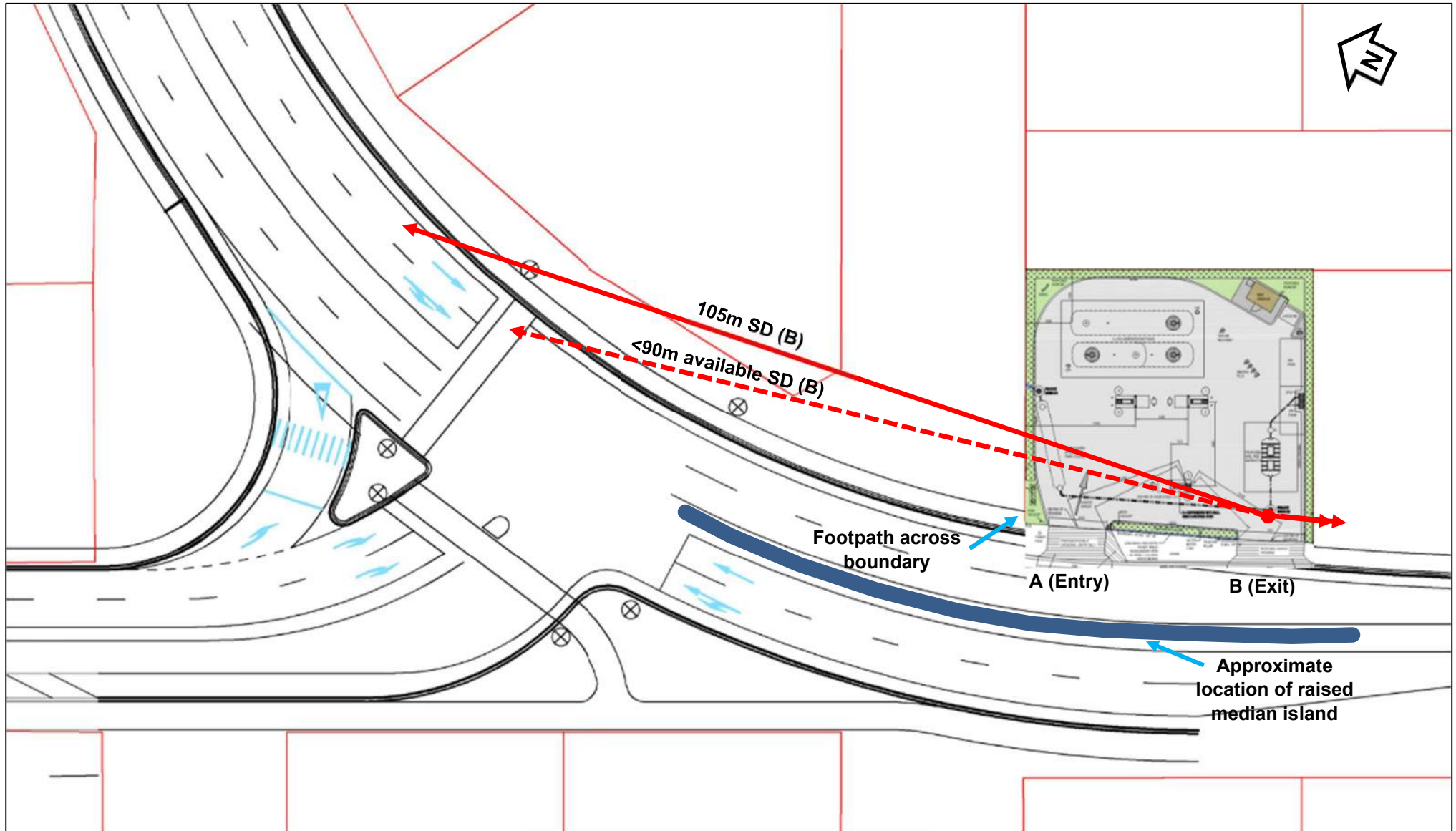


Figure 1: Pokeno Road Signalised Intersection Schematic Drawings (WSP, 9 October 2020) with Gull Site Layout Overlay (Technitrades Architecture, 13 November 2020) (Not to scale)

2.2. Site Access

2.2.1. Great South Road Merge

The proposed vehicle crossing A (entry) is located where Great South Road will merge from two lanes to one lane. Locating the vehicle crossing near the merge point has the effect of an increased risk of vehicle-vehicle collisions. Conflict may arise from some vehicles accelerating through the intersection not anticipating other vehicles to then slow to enter the service station resulting in rear-end crashes.

The dual southbound lanes also present an issue due to the limited weaving distance for vehicles that approach the site from the Pokeno Road / Great South Road intersection positioned in the inner lane, but need to move to the outer lane to enter the site.

At a travel speed of 50km/h a driver would require 81m to change lanes.¹ The proposed vehicle crossing A (entry) is located approximately 45m from the intersection. We are concerned that the short distance between the intersection and the entrance to the proposed site will result in an increase in crashes.

2.2.2. Vehicle Access

The proposed intersection improvements include a raised median island along Great South Road, past the proposed site. The design and extent of the raised median island is not known at the time of writing.

We note that the Applicant's TIA confirmed that the Gull fuel delivery tankers will arrive from the south, turn right into the site, and turn right to exit. If a raised median island is constructed on Great South Road, access to the site will be restricted to left-turn in and left-turn out only.

The vehicle tracking diagrams supplied by the Applicant are shown in the figures below with the approximate location of the raised median island and red-dashed arrow indicating the left-turn movements. We have not done any vehicle tracking analysis.

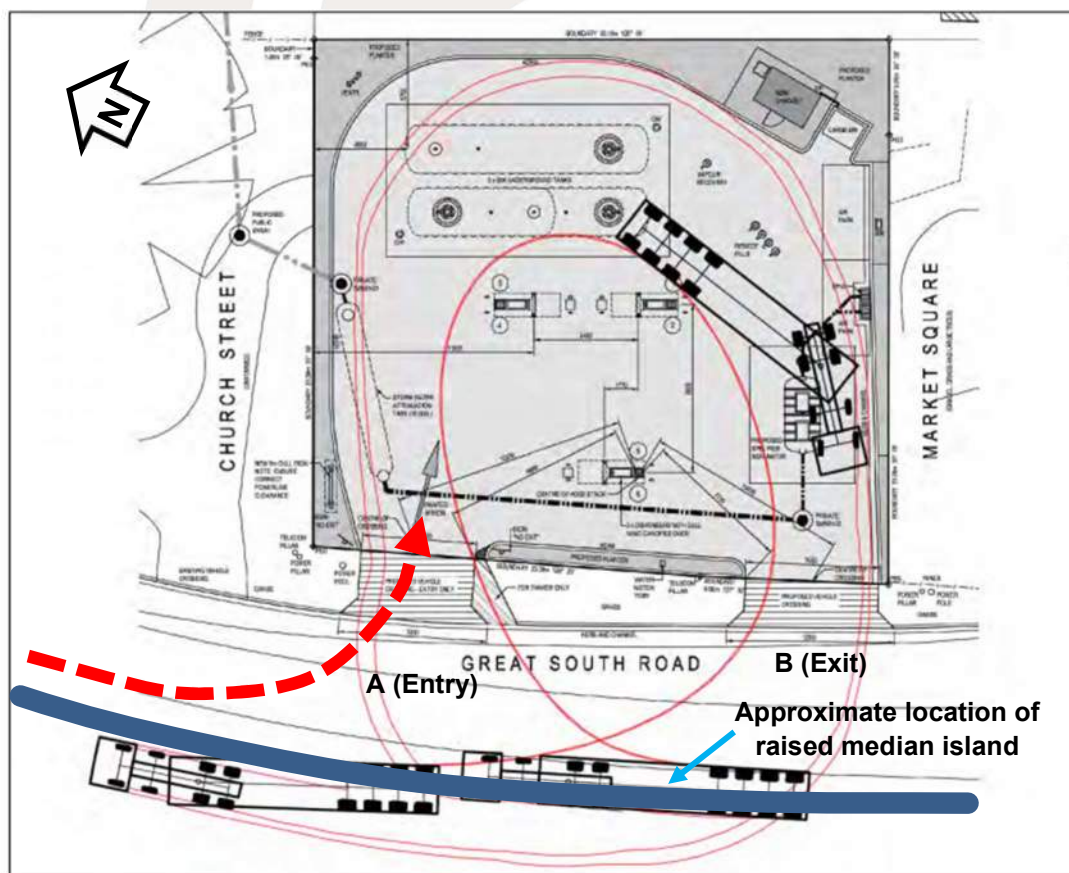


Figure 2: Fuel Tanker Swept Path for Right-Turn Entry, Right-Turn Exit (TIA)

¹ Based on the maximum rate of lateral movement of 0.6m/s for a through lane merge as per Austroads Part 4A, Commentary 3.

We consider it unlikely that a fuel delivery tanker will be able to turn left into the site (from the north) without occupying both southbound movement lanes and potentially impacting with the raised median island. Crossing A will require redesign.

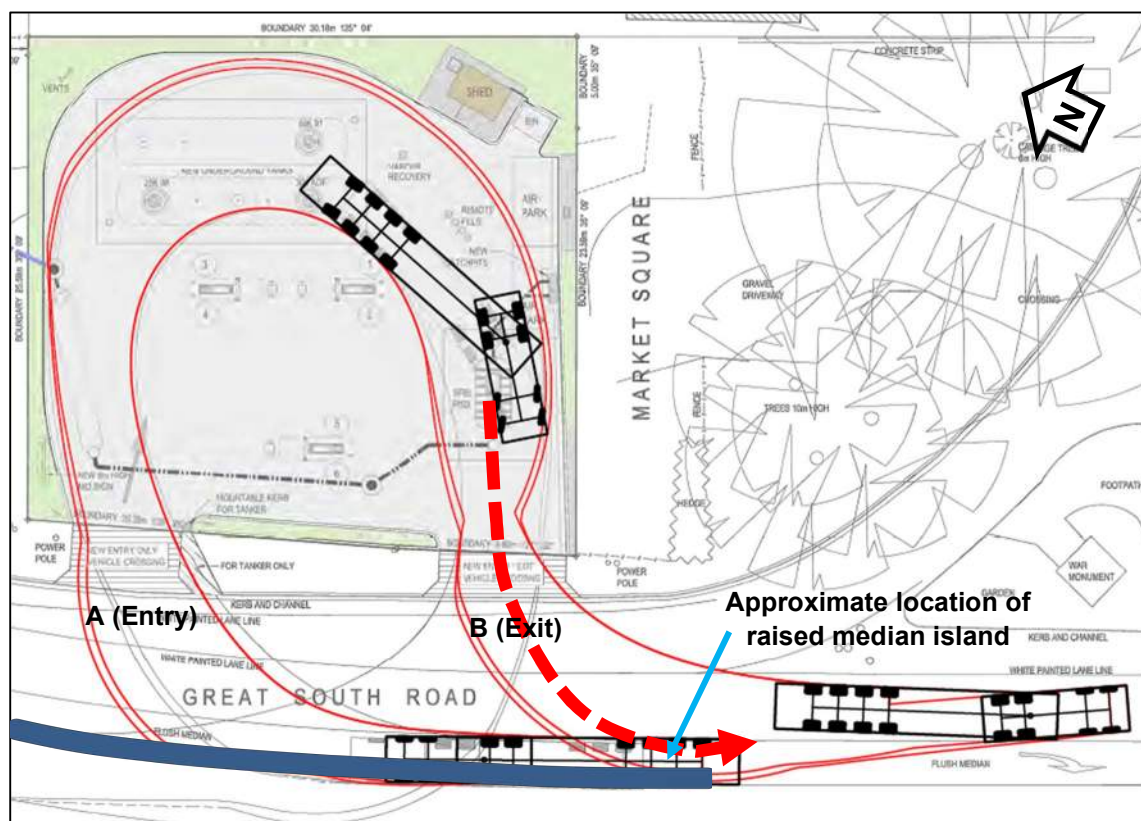


Figure 3: Fuel Tanker Swept Path for Right-Turn Entry, Left-Turn Exit (979-200716Dwg.PDF)

Our peer review commented in Section 4.6 On-site Manoeuvring, “the tanker can turn left to exit the site (as shown in Figure [3]) if the flush median space is used.” However, if there is a raised median island, we consider it unlikely that a fuel delivery tanker will be able to turn left out of the site (towards the south) without impacting the island.

If a raised median island is constructed on Great South Road, it is unlikely that a fuel delivery tanker would be able to access the site safely, without redesign of the vehicle crossings and on-site manoeuvring space.

In addition to the discussion above, we consider it unlikely that fuel delivery tanker would be able to enter the site via left-turn, manoeuvre on-site, before exiting the site via left-turn. We consider the vehicle tracking space required would be in excess of the space available on-site due to the lock-to-lock time² for tractor units.

2.2.3. Vehicle Queuing

In section 4.5 of our review, we comment: “The trip generation estimation indicates the six pumps will be required to serve up to 60 tph. This equates to approximately five vehicles per pump and an average visit duration of 12 minutes per vehicle if no queuing is to occur. This appears to be a reasonable rate of turnover for a service station and given the capacity for some on-site queuing.”

Assuming one-way flow through the site (entry at crossing A and exit at crossing B), there appears to be capacity for up to 5 vehicles to queue within the site. Queue lengths on the street would have to be greater than 40m (approximately 7 vehicles) to reach the Pokeno Road / Great South Road intersection or the Market Street right turn bay.

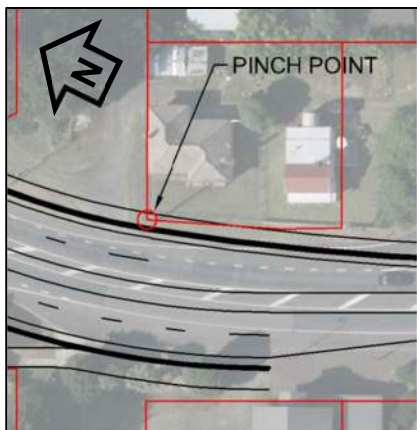
If vehicles are only able to access the site via left-turn entry from Great South Road (due to the raised median island), on-road queuing space is limited to the north approach to the site. The likelihood of on-road queuing is increased, and the resulting queue length is approximately doubled. Queues extending to the north towards

² Lock-to-lock time is the time that it takes the driver of the vehicle to turn the steering from the maximum angle (full lock) in one direction to maximum angle (full lock) in the opposite direction in a single continuous movement.

the Pokeno Road / Great South Road intersection could extend into the intersection, reducing efficiency and increasing the likelihood of crashes. The likelihood of on-road queuing is increased during Gull's promotional days when a fuel discount is offered.

The Gull promotional days are expected to occur about 12 days per year (approximately one per month). Any queuing effects would likely occur at peak times, say during morning, afternoon, and evening peaks, and would likely be of limited duration. However, given the proximity of the signalised intersection at Pokeno Road / Great South Road and the merge taper in front of the site, we consider the effects to be more than minor.

2.2.4. Pedestrian Access



The WSP Intersection Schematic Drawings show the proposed intersection improvements will include widening of Great South Road in front of the proposed site. We note that a “pinch point” is identified on the WSP Intersection Schematic Drawings as shown in the figure at left.

The 2m wide footpath encroaches over the property boundary of the proposed site.

The proposed intersection design will require revision to avoid this pinch point, or acquisition of the land necessary to achieve the required berm and footpath widths.

Figure 4: Footpath Pinch Point (WSP, 9 October 2020)

2.3. Urban Design and Landscaping

The updated Urban Design and Landscape Plan (Boffa Miskell, 4 November 2020) as shown in Figure 6 below includes the alterations requested in our peer review and discussed at the meeting of 9 October 2020. The changes shown on the Boffa Miskell plan have been incorporated into the updated site plans.

We note the following amendments of relevance to transport:

- = Minimum of 1m wide gardens around the perimeter of the site (including where the sign and air hose are located);
- = “Textured and coloured concrete vehicle access”; and
- = Amended sign as per the Urban Design response by Boffa Miskell (8 September 2020).

2.3.1. Manoeuvring Space On-Site

The updated site plan shows 1 metre wide gardens around the perimeter of the site.

From the site plans previously provided it is unclear if this is a significant change from the earlier site layout. We are concerned the 1m wide gardens could reduce the manoeuvring space on-site and mean that a fuel delivery vehicle is unable to turnaround without reversing.

We suggest the applicant provide vehicle tracking plans for the updated access arrangements and site layout.

2.3.2. Landscaping Changes

We note the updated site plan shows 1m high hedging along the frontage with Great South Road (refer Figure 5). This is inconsistent with the agreed 600mm height limit for vegetation in this area.

The updated site plan shows the gardens on the south/Market Square boundary extending to the frontage with Great South Road which differs from the previous site plans. As discussed above in Section 2.1.2 Vehicle Crossing B, we note the proposed changes to the road alignment in front of the proposed site may result in the driver eye position being located further back into the site. As such, sight distance to the south will be compromised if the landscaping along the south/Market Square boundary exceeds 600mm in height within 3-4m of Great South Road.

We consider it prudent to allow a driver exiting the site to be able to see vehicles on Market Street east turning onto Great South Road.

As discussed above we suggest the Applicant provide updated site plans that include the WSP design for the signalised intersection.

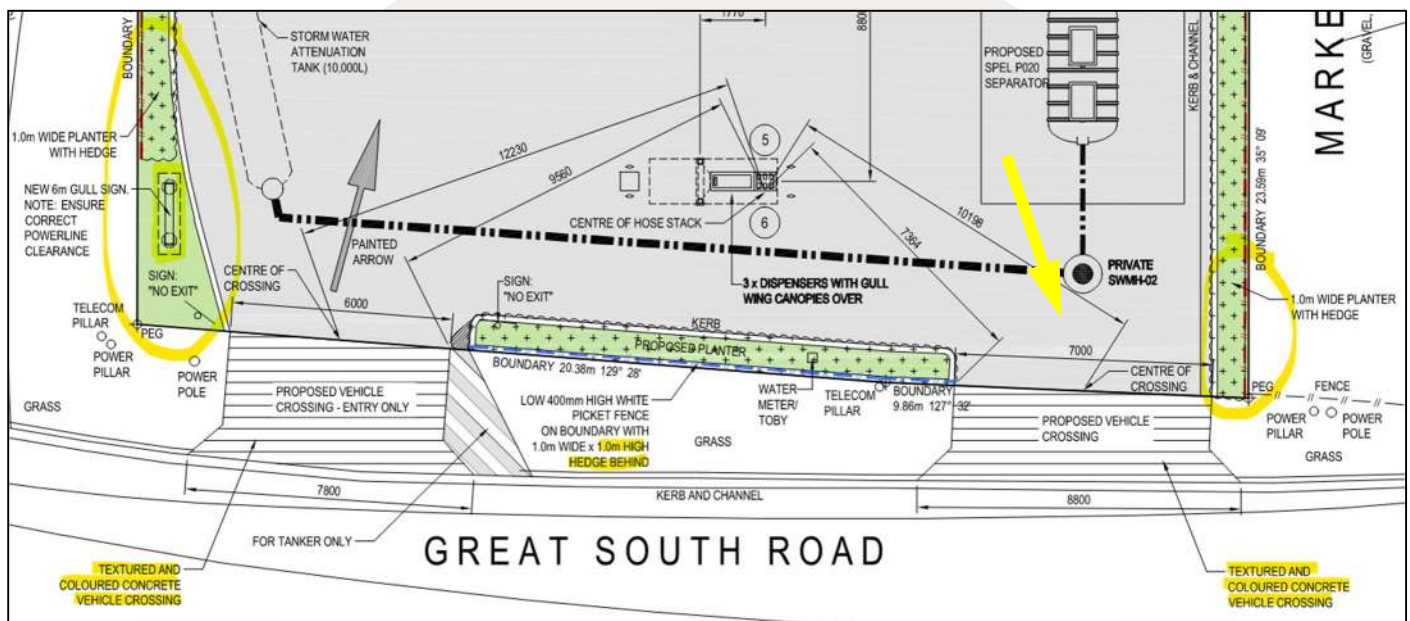


Figure 5: Updated site plan (Technitrades Architecture, 13 November 2020)

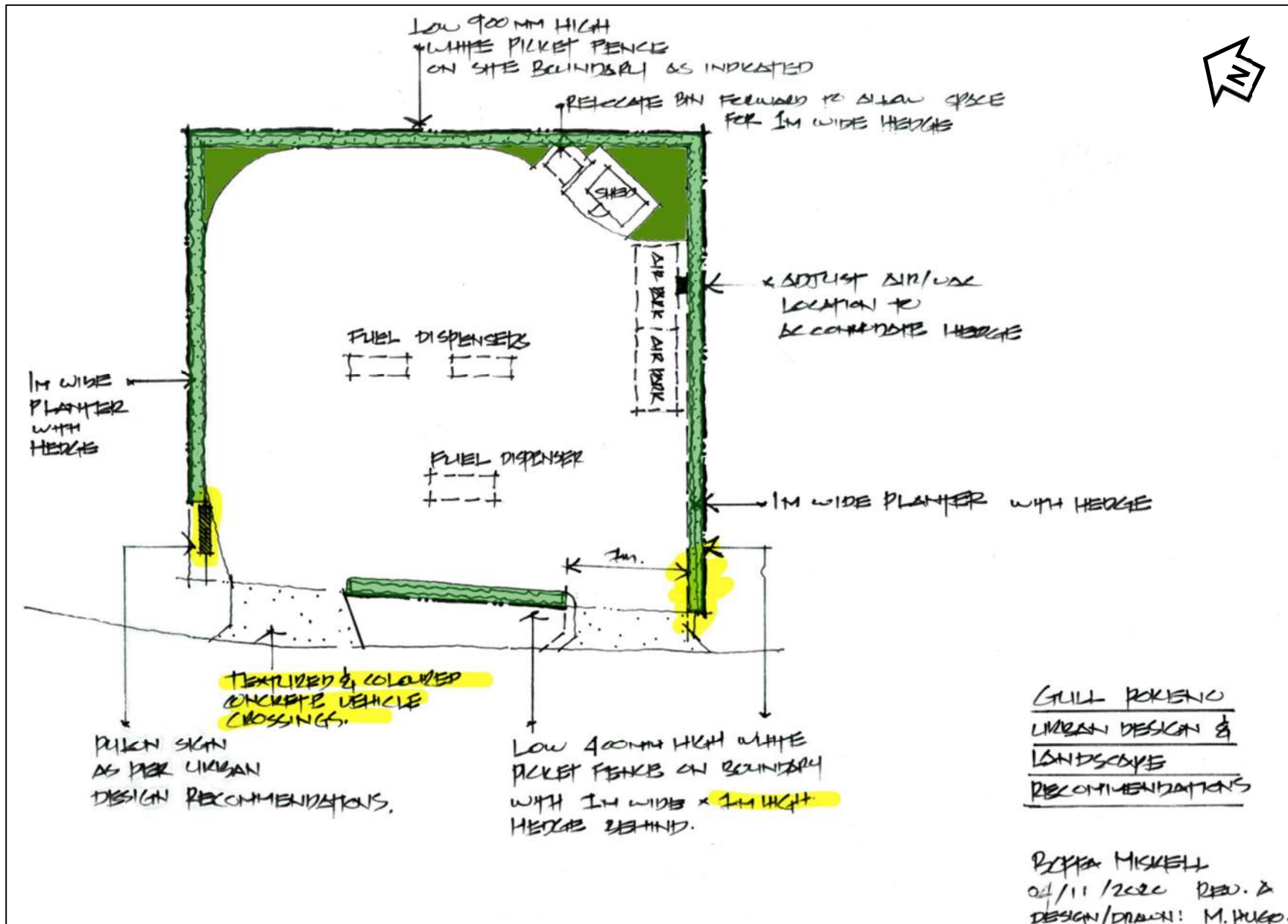


Figure 6: Boffa Miskell Urban Design and Landscape Plan (4 November 2020)

2.3.3. Vehicle Crossing Surfacing

We note the updated site plan shows “Textured and coloured concrete vehicle crossings”.

In our peer review we commented in Section 4.3.1 Vehicle Crossing Dimensions, “*we are concerned that the wide crossing may encourage vehicles to exit at crossing A, because it appears wide enough for two-way use, and vehicles may enter the site at higher than appropriate speeds—increasing the risk of vehicle-vehicle conflict at the crossings.*”

Our suggested mitigation (shown in Figure 7 below) sought to visually narrow the vehicle crossings to a single lane for entry and exit and discourage cars and light vehicles from using the additional width to enter at high speed or travel against the flow of traffic, whilst allowing heavy vehicles to track over the raised and textured areas.

In our peer review we stated that “*hatched marking alone would not alleviate our concerns.*” Similarly, textured, and coloured concrete across the full width of the vehicle crossing would not alleviate our concerns. The raised surfacing should be limited to the area beyond that required for manoeuvring by light vehicles.

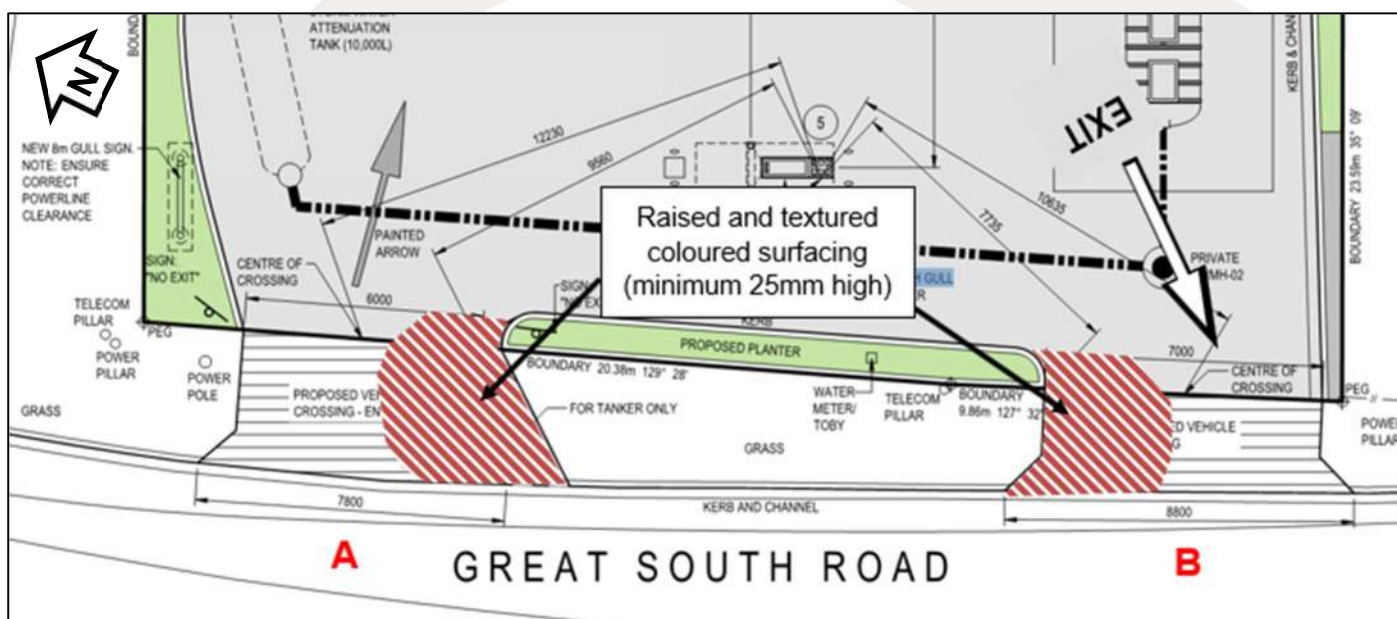


Figure 7: Recommended Vehicle Crossing Treatment (Gray Matter Peer Review, Issue 1, July 2020)

2.3.4. Amended Sign

We understand the amended sign (as per the Urban Design response letter from Boffa Miskell, 8 September 2020) extends to ground level and will be located a minimum of 6m from the frontage of the site along the western boundary.

We note that the Boffa Miskell plan and updated site plan both show the sign within the 6m setback which is inconsistent with the required mitigation. Locating the sign further back into the site may encroach on the manoeuvring space required for fuel delivery tankers.

As suggested above, the applicant should provide vehicle tracking plans for the updated site layout.

3. Effects Related to Transport

The transport effects of the proposed development relate to safety and efficiency. We have not considered the consequential effects of traffic such as visual effects and noise effects. The following section comments on the key transport aspects and effects for the proposed development.

Items shown in **red text** are updated from our peer review (Issue 1, July 2020) and relate to the effects of the proposal with specific regard to the proposed intersection improvements. Strikethrough text relates to items that are not relevant to the proposal with the proposed intersection improvements, or they are items that the Applicant has addressed.

| Effect | Discussion | Significance and Extent of Effects | Recommendation |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety – Vehicle crossings | <p>The proposed vehicle crossings are on the major road frontage. The PDP requires property access to be from the minor road.</p> <p>The wide vehicle crossing encourages vehicles to exit at crossing A.</p> <p>The proposed vehicle crossings have sight distance deficiencies which increases the likelihood of vehicle-vehicle collisions.</p> <p>The proposed crossings do not meet the separation distance requirements.</p> <p>The proposed development will significantly increase the turning movements to/from Great South Road in the length between Pokeno Road and Market Street, increasing the likelihood of vehicle-vehicle collisions.</p> <p>The proposed intersection improvements and raised median may prohibit access to the site for trucks. Access may be possible if the site layout and vehicle crossing designs are altered.</p> <p>The Applicant has not provided information to show how the proposed site could operate with the proposed intersection improvements.</p> <p>The vehicle crossings are located where southbound vehicles will be merging from two-lanes to one-lane.</p> | <p>Moderate.</p> <p>Effects impact all road users on Great South Road between Pokeno Road and Market Street.</p> | <p>Unlikely to be practical to modify vehicle crossing locations for the proposed development.</p> <p>Not practical to reduce vehicle crossing dimensions due to swept path of fuel delivery tanker.</p> <p>Delineate crossings (as indicated in Figure 7 above) with raised and textured coloured surfacing (min. 25mm high).</p> <p>Use signage and markings to make crossing B “Exit Only”.</p> <p>Ensure proposed signage does not obstruct sight distance for the vehicle crossings. The sign setback may need to be increased to provide sufficient sight distance for the proposed intersection improvements.</p> <p>Ensure proposed planting does not obstruct sight distance for the vehicle crossings. The vegetation height restriction may need to include the south/Market Square boundary to achieve sight distance if the proposed intersection improvements proceed.</p> <p>Updated vehicle tracking is required.</p> |

| Effect | Discussion | Significance and Extent of Effects | Recommendation |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | Remove vegetation from roadside berm (opposite Pokeno Road). Relocate the boundary fence of property at 80 Great South Road. |
| Safety – On-site | <p>The rear carpark space is not long enough.</p> <p>On-site space for queuing and manoeuvring appears adequate. Occasional “jams” may occur during exceptional peak times or when the fuel delivery tanker is on-site, but these events are expected to be infrequent and minor.</p> <p>Fuel delivery tanker must enter by turning right. Potential berm or property damage if a driver mistakenly attempts to enter by turning left.</p> <p>No swept path provided to show the tanker can turn left when exiting. (Has been provided).</p> <p>The proposed intersection improvements and raised median island may restrict access to left-in and left-out and restrict on-site manoeuvring.</p> <p>The Applicant has not provided information to show how the proposed site could operate with the proposed intersection improvements.</p> | <p>Moderate.</p> <p>Effects could include damage to shoulders, berms, and adjacent property.</p> | <p>Extend rear carpark space to 6.0m long.</p> <p>Not practical to accommodate left turn entry for fuel delivery tanker (vehicle crossing already widened).</p> <p>Provide a turning path to show the fuel delivery tanker turning left to exit. (Has been provided).</p> <p>Updated vehicle tracking is required.</p> <p>Establish a preferred circulation route to ensure tanker drivers can arrive or depart in either direction. (Has been provided).</p> |
| Safety – Great South Road | <p>There will be an approximate 7% increase in traffic on Great South Road.</p> <p>Increase in turning movements increases the likelihood of vehicle-vehicle collisions. However, peak turning volume equates to one vehicle per minute (60 tph) and is not considered a significant change in traffic.</p> <p>The raised median island would prevent right-turn movements limiting the number of conflict points but introduces the potential for u-turns at the signals.</p> <p>The vehicle crossings are located where southbound vehicles will be merging from two-lanes to one-lane.</p> <p>Combined merge area and potential on-road queuing increases the likelihood of crashes.</p> <p>On-road queuing is limited to a single approach and could extend into the Pokeno Road / Great South Road intersection,</p> | <p>Moderate.</p> <p>Effects impact all road users over a short length of Great South Road.</p> | <p>There does not appear to be a practical solution to avoid or mitigate the safety effects. However, the effects are likely to be no more than minor.</p> |

| Effect | Discussion | Significance and Extent of Effects | Recommendation |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| | reducing efficiency and increasing the likelihood of crashes. | | |
| Efficiency – Road network | Comments as above for safety aspects on Great South Road. Efficiency affected by vehicles slowing and turning into the site. Efficiency effects are likely to be noticeable, but infrequent. | Low. Effects impact all road users. | None. |
| Active transport and recreation | There is no footpath on the eastern side of Great South Road (on the site frontage) and there are no marked cycling facilities in the vicinity. The proposed development should not preclude the addition of footpaths and cycling facilities in the future. The proposed intersection improvements include footpaths on the eastern side of Great South Road. However, the footpath encroaches over the boundary of the proposed site. | Negligible. Low. Effects impact all active transport users and recreational walkers, runners, and cyclists. | None. Waikato DC to resolve the issue of the footpath pinch point. |
| Construction effects | The potential for adverse effects from construction related traffic include delays, crashes, dust, and noise. These effects could be mitigated through implementation of an approved construction traffic management plan that includes temporary traffic management. The trip generation and traffic effects from construction activities are expected to be of short-term duration and not considered significant. | Low. Temporary effects related to traffic impact all road users. | Require a Construction Traffic Management Plan and a Temporary Traffic Management Plan. |

Table 1: Appraisal of Potential Transport-related Effects

4. Avoiding or Mitigating Actions

4.1. Existing Road Layout

Based on our assessment of the proposal with the existing road layout on Great South Road, we consider that without mitigation the potential safety effects from the non-compliant sight distance and vehicle manoeuvring would be unacceptable.

The potential safety effects arising from the non-compliant sight distance and limited on-site space could be mitigated by changing the design and through conditions of consent. The following mitigation would be required for the existing layout on Great South Road:

- = Remove vegetation from roadside berm (opposite Pokeno Road);
- = Relocate the boundary fence at 80 Great South Road to the property boundary;
- = Minimum setback of 6.0m from Great South Road along the north/Church Street boundary for any signage for the proposed development and vegetation in this zone not to exceed 600mm in height;
- = Maintain planting within the proposed development to ensure unobstructed sight distance of 90m (minimum) for crossing B;
- = Extend rear carpark space to 6.0m long;
- = Provide delineation of vehicle paths at crossing A and crossing B using raised and textured coloured surfacing (minimum 25mm high) as indicated in Figure 7 above, subject to approval by Waikato District Council;

- = Use signs and markings to make crossing B “Exit Only”;
- = Consult with Waikato District Council on the preferred heavy vehicle circulation route;
- = Include the requirements for Gull ID signage location, vegetation maintenance, right-turn entry and exit requirements for fuel delivery tankers, and a heavy vehicle circulation route in the Site Management Plan; and
- = Provide a Construction Traffic Management Plan including a Temporary Traffic Management Plan.

As proposed, with the existing layout on Great South Road, we consider the effects of the sight distance shortfall to be more than minor. If the suggested mitigation is carried out (i.e. remove roadside vegetation, relocate 80 Great South Road fence onto boundary, locate Gull ID sign on the south/Market Square boundary and maintain on-site planting to maximise sight distance), the effects relating to the minor shortfalls in sight distance are considered to be minor or less.

4.2. Proposed Intersection Improvements

Based on our assessment of the proposal with specific regard to the proposed intersection improvements, we consider that there are significant effects which may not be able to be effectively mitigated. We have assumed that the intersection improvements will include a raised median island that limits site access to left-in/left-out movements.

The potential safety effects from the non-compliant sight distance, could be mitigated by changing the design and through conditions of consent. In addition to the mitigation required in Section 4.1, the following increased mitigation would be required:

- = Increased setback of 14-15m from Great South Road along the north/Church Street boundary for any signage for the proposed development and vegetation in this zone not to exceed 600mm in height; and
- = Increased setback of 3-4m from Great South Road along the south/Market Street boundary for any signage for the proposed development and vegetation in this zone not to exceed 600mm in height.

We consider the effects of the sight distance shortfall to be more than minor. If the suggested mitigation is carried out (i.e. remove roadside vegetation, relocate 80 Great South Road fence onto boundary, set back the Gull ID sign and maintain on-site planting to maximise sight distance), the effects relating to the remaining minor shortfalls in sight distance are considered to be minor or less.

The proposed intersection improvements and altered road layout on Great South Road will significantly alter the access options for the proposed site, to the extent that the site may not be suitable for a high trip generating activity, particularly one that requires access by large heavy vehicles.

We consider that the potential safety effects arising from the vehicle access restrictions, merging traffic and limited on-site space are significant and may not be able to be effectively mitigated.

5. Conclusion

We have previously reviewed the Applicant’s Traffic Impact Assessment, taking into account the changes following the s92 request and have considered the potential effects related to transport. This assessment specifically considers the impacts of the proposed signalisation of the Pokeno Road / Great South Road intersection.

The proposed development is likely to generate 600 vehicle movements per day (60 vehicle movements per hour) on Great South Road. It is expected that about 50% of the total trips attracted to the development will be from passing traffic already using Great South Road so there will be an additional 300 vehicle movements per day (30 vehicle movements per hour). The change in traffic may not be noticed on Great South Road due to typical variations in daily traffic. The increase in turning movements (estimated to be one vehicle per minute in a peak hour) is likely to be noticed but is not considered a significant change in traffic conditions.

There is potential for adverse safety effects on Great South Road related to sight distance restrictions for vehicles turning to and from the proposed development and the relative location of the southbound merge. Without mitigation these potential safety effects would be unacceptable.

If the proposed intersection improvements proceed, the proposed site may not be suitable for a high trip generating activity, particularly one that requires access by large heavy vehicles. Further information is required from the Applicant to confirm vehicle manoeuvring can be achieved if a raised median island is constructed on Great South Road.

As noted in our peer review, we suggest that Council considers relocating the memorial and simplifying the Market Street intersection layout as part of any centre streetscape works within Pokeno Village, irrespective of the proposed development at 72 Great South Road.

If you have any queries, please do not hesitate to contact us.

Yours sincerely



Melanie Parsons
Civil/Transportation Engineer



Alastair Black
Transportation Engineer



30 July 2020



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Dear Milan

68-72 GREAT SOUTH ROAD, POKENO – TRANSPORT PEER REVIEW

1. Background and Purpose

Gull New Zealand Limited (the Applicant) propose to develop a 24-hour service station at 68-72 Great South Road, Pokeno. Waikato District Council require a review of the Applicant's transportation assessment report and potential effects, related to transport, of the proposal.

Gray Matter Ltd has been engaged by Waikato District Council to review the transportation aspects of the Applicant's proposal for a petrol station at 72 Great South Road, Pokeno.

This review includes an assessment of the likely traffic and transportation issues associated with the proposed service station. It comprises:

- = A summary description of the site, and comments on the surrounding road network, including function and traffic volumes;
- = Consideration of recent or proposed changes to the transport environment;
- = Comments on the proposal, including traffic generation and access;
- = Review of transportation effects, considering safety, efficiency and on-site manoeuvring;
- = Review of options for mitigation of potentially adverse effects; and
- = Conclusions, including a summary of impacts and suggested conditions of consent.

Our assessment is based on the following information:

- = A site visit (24 June 2020);
- = Site plans of the proposed service station (Technitrades Architecture, Version 1 05/06/2020);
- = Traffic Impact Assessment (TIA), (Traffic Solutions Ltd, 4 June 2020);
- = Assessment of Environmental Effects (Hayson Knell, April 2020);
- = Traffic count and road geometry information from Waikato DC RAMM and mobileroad.org;
- = NZ Transport Agency Crash Analysis System (CAS); and
- = NZ Transport Agency Safer Journeys Risk Assessment Tool.

The purpose of this transport review is to:

- = Review the transportation effects of the proposal;
- = Assess the suitability of the site for a service station; and
- = Provide Waikato DC with recommendations.

We have reviewed the transportation aspects of the proposal using the Franklin Section of the Waikato Operative District Plan (ODP), and Waikato Proposed District Plan (PDP).

2. The Proposal

The site is located at 68-72 Great South Road in Pokeno. Gull New Zealand propose to develop a 24-hour service station on the site. The site location and proposed layout are shown in the figures below.



Figure 1: Location of site (image: Google Maps)



Figure 2: Looking south towards the property at 68-72 Great South Road, Pokeno (image: Google Street View)

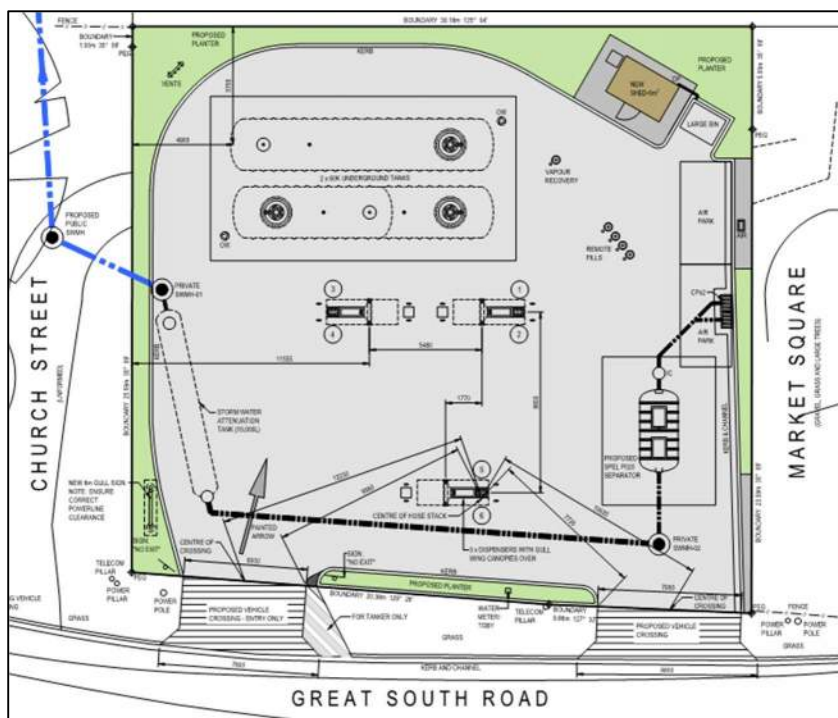


Figure 3: Site Plan of the proposed service station (Drawing 2998-B03 Rev F)

3. Surrounding Transport Network

The characteristics of the roads surrounding the site are summarised in the table below.

| Road | Posted speed limit (km/h) | NZTA SAAS ¹ (km/h) | District Plan Road Hierarchy | Traffic Volume ADT ² (veh/day) | Heavy commercial vehicles (HCV) |
|-------------------------------------------|---------------------------|-------------------------------|------------------------------|-------------------------------------------|---------------------------------|
| Great South Road | 50 | 50 | Collector Road ³ | 3,995 | 10% |
| Market Street (North of Great South Rd) | 50 | 40 | Local Road | 20 | 4% |
| Market Street (South of Great South Rd) | 50 | 40 | Local Road | 175 | 4% |
| Church Street (North of Great South Road) | -- | -- | Paper Road | -- | -- |
| Church Street (South of Great South Road) | -- | -- | Local Road (Private Lane) | 20 | 6% |

Table 1: Summary of Surrounding Transport Network

Market Street (North) provides access to 19 residential dwellings and is likely to have an ADT greater than the estimated 20 vehicles per day. The traffic volume on this street could be about 190 veh/day.

The Applicant's TIA notes that the traffic volume on Great South Road is also likely to be higher than the published data, estimating the current traffic to be about 4,500 veh/day.

The NZTA Safer Journeys Risk Assessment Tool shows this section of Great South Road has an ONRC⁴ of Primary Collector and a mean operating speed of 40-44km/h.

¹ Safe and Appropriate Speed from NZTA Safer Journey Risk Assessment Tool <https://nzta.abley.com/megamaps/>

² <https://mobileroad.org> ADT = average daily traffic (estimates as at January 2020)

³ As defined in the PDP

⁴ ONRC = one network road classification

3.1. Planned Transport Network Changes

Plan Change 21 included an upgrade to the intersection of Pokeno Road and Great South Road. The layout of the proposed upgrade to a signalised intersection is shown in Figure 4 below. The installation of signals at the intersection will possibly be carried out in the next few years.

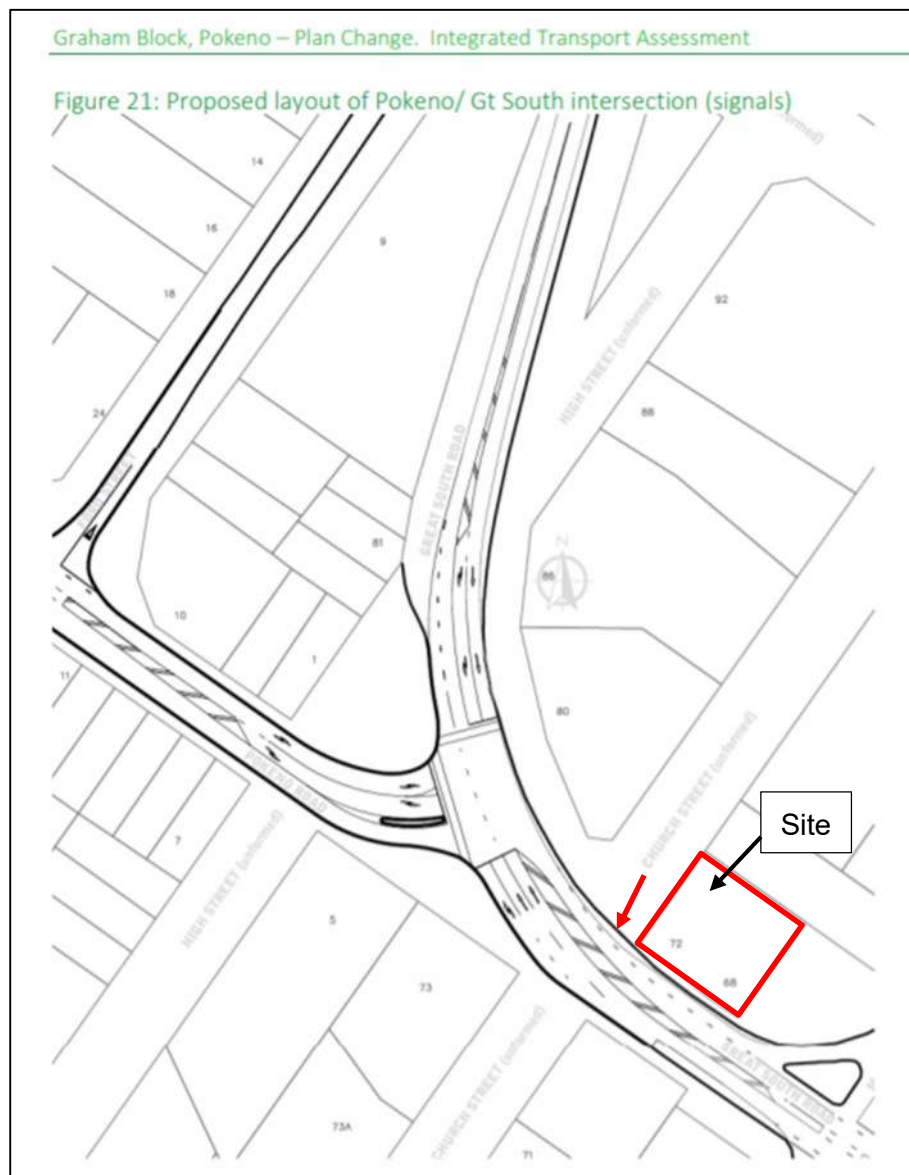


Figure 4: Proposed layout of Pokeno Road/Great South Road Signalised Intersection (From Graham Block, Pokeno, Integrated Transport Assessment, Arrive 2017).

We note that the figure shows road widening where Great South Road intersects with the unformed section of Church Street (indicated by the red arrow). The potential loss of berm space may result in adverse safety effects for the proposed development at 72 Great South Road.

The proposed road layout does not appear to allow for future provision of pedestrian or cycling paths on Great South Road.

4. Review of Applicant's Assessment

4.1. Trip Generation of the Proposal

The Applicant's trip generation is based on information from the following sources:

- = New Zealand Trips and Parking Database (NZTPDB);
- = Institute of Transportation Engineers (ITE) "Trip Generation 7th Edition";
- = Roads and Traffic Authority New South Wales (RTA) "Guide to Traffic Generating Developments"; and
- = Traffic generation surveys carried out by Traffic Solutions Limited at service stations elsewhere.

The Applicant presents several sources of trip generation rates and applies these to the proposed site to give an estimate of the trips per hour (tph) generated by the proposed development. The discussion in the TIA notes that the proposed development does not include a shop or other ancillary services (workshop, car wash, etc), therefore the trip generation would be lower than at other surveyed sites. The trip generation rate used by the Applicant is based on traffic generation survey information not presented in the TIA.

We have compared the Applicant's trip generation information to other published sources as summarised below.

The trip generation information is summarised below, with our comments regarding the suitability of each data source for the proposed development. Trip generation calculations have been based on a site area of 911m² and 6 pumps. One vehicle entering and exiting the site is counted as two trips.

| Source | Trip Generation Rate | Trip Generation of Proposal | Comments |
|------------------------------|------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------|
| Rates From TIA | | | |
| NZTPDB | -- | -- | No rates included in TIA |
| ITE 7 th Edition | 12-15 tph / pump | 70-90 tph | |
| RTA | tph / m ² site area and tph / shop GFA | 35 tph | Rate not given in TIA. Estimate excluded rate for tph / shop GFA. |
| Traffic Solutions | 110-150 tph | 60 tph | Surveyed results scaled down due to no shops or ancillary services included in the proposed development. |
| Other Published Rates | | | |
| NSW Analysis Report | 0.067 tph / m ² site area | 61 tph | Based on 5 surveyed sites, excluding locations with ancillary services. |
| ITE 10 th Edition | 182.17 tpd / pump 14.41 tph / pump | 1,093 tpd 86.5 tph | Based on General Urban/Suburban location and included sites with ancillary services. |

Table 2: Summary and Comment on Trip Generation Rates

The TIA estimates the trip generation for the site to be 60 tph in a peak hour and approximately 600 trips per day. The estimate in the TIA is comparable to the rate in the NSW Analysis Report which excluded locations with ancillary services. We consider the estimated trip generation in the TIA to be a reasonable basis for the assessment.

There is potential for an increase in trips if Gull runs a fuel promotion such as a "Discount Day" when fuel is sold for a discounted price. The information published on the Gull New Zealand website (gull.nz) indicates that the "Discount Day" promotions are typically held monthly and the discount is around 10c per litre. The frequency and nature of these promotions are comparable to other fuel retailers and we do not consider the likely increase in traffic to require specific mitigation.

4.2. Estimation of Trip Types

The TIA discusses the likely proportion of pass-by and diverted-linked trips that will visit the proposed development and comments that the “ITE suggests that about 85% of traffic turning at service station accesses is pass-by or diverted-linked traffic.” The TIA then concludes that given 15% of the traffic will be primary trips, this equates to no more than 10 new vehicle trips per hour on the road network.

Excluding diverted-linked trips from the new trips attracted to the proposed development ignores the trips that divert to Great South Road for the purposes of getting fuel and underestimates the change in traffic as a result of the development. The ITE Trip Generation Handbook 3rd Edition (September 2017) includes data on pass-by and non-pass-by trips for Gasoline/Service Stations. The non-pass-by trips are divided into primary and diverted trips. The data tables from ITE are shown below.

**Table E.35 Pass-By and Non-Pass-By Trips Weekday, AM Peak Period
Land Use Code 944—Gasoline/Service Station**

| SIZE (1,000 SQ. FT. GFA) | VEHICLE FUELING POSITIONS | LOCATION | WEEKDAY SURVEY DATE | NO. OF INTERVIEWS | TIME PERIOD | PASS-BY TRIP (%) | NON-PASS-BY TRIPS (%) | | | ADJ. STREET PEAK HOUR VOLUME | SOURCE |
|-----------------------------------|---------------------------------|---------------------|---------------------------|----------------------|----------------|---------------------|-----------------------|----------|-------|------------------------------------------|--------|
| | | | | | | | PRIMARY | DIVERTED | TOTAL | | |
| 2.3 | 6 | Gaithersburg, MD | 1992 | 37 | 7:00–9:00 a.m. | 32 | 41 | 27 | 68 | 2,080 | RBA |
| 2.1 | 6 | Bethesda, MD | 1992 | 26 | 7:00–9:00 a.m. | 58 | 23 | 19 | 42 | 2,080 | RBA |
| 1.7 | 6 | Wheaton, MD | 1992 | 21 | 7:00–9:00 a.m. | 67 | 14 | 19 | 33 | 900 | RBA |
| 2.0 | 8 | Gaithersburg, MD | 1992 | 46 | 7:00–9:00 a.m. | 87 | 13 | 0 | 13 | 2,235 | RBA |
| 1.2 | 6 | Damascus, MD | 1992 | 21 | 7:00–9:00 a.m. | 43 | 28 | 29 | 57 | 870 | RBA |
| 0.3 | 12 | Wheaton, MD | 1992 | 36 | 7:00–9:00 a.m. | 61 | 8 | 31 | 39 | 3,480 | RBA |

Average Pass-By Trip Percentage: 58

“—” means no data were provided

**Table E.36 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period
Land Use Code 944—Gasoline/Service Station**

| SIZE (1,000 SQ. FT. GFA) | VEHICLE FUELING POSITIONS | LOCATION | WEEKDAY SURVEY DATE | NO. OF INTERVIEWS | TIME PERIOD | PASS-BY TRIP (%) | NON-PASS-BY TRIPS (%) | | | ADJ. STREET PEAK HOUR VOLUME | SOURCE |
|--------------------------------|---------------------------------|------------------------|---------------------------|----------------------|----------------|---------------------|-----------------------|----------|-------|---------------------------------------|-----------------------------------|
| | | | | | | | PRIMARY | DIVERTED | TOTAL | | |
| — | — | Chicago suburbs, IL | 1987 | 48 | 3:00–7:00 p.m. | 21 | — | — | 79 | — | Kenig, O'Hara, Humes, Flock |
| — | — | Chicago suburbs, IL | 1987 | 34 | 3:00–6:00 p.m. | 25 | — | — | 75 | — | Kenig, O'Hara, Humes, Flock |
| — | — | Chicago suburbs, IL | 1987 | 42 | 3:00–6:00 p.m. | 20 | — | — | 80 | — | Kenig, O'Hara, Humes, Flock |
| 2.3 | 6 | Gaithersburg, MD | 1992 | 55 | 4:00–6:00 p.m. | 40 | 11 | 49 | 60 | 2,760 | RBA |
| 2.1 | 6 | Bethesda, MD | 1992 | 30 | 4:00–6:00 p.m. | 53 | 20 | 27 | 47 | 1,060 | RBA |
| 1.7 | 6 | Wheaton, MD | 1992 | 18 | 4:00–6:00 p.m. | 61 | 6 | 33 | 39 | 2,510 | RBA |
| 2.0 | 8 | Gaithersburg, MD | 1992 | 47 | 4:00–6:00 p.m. | 62 | 23 | 15 | 38 | 2,635 | RBA |
| 1.2 | 6 | Damascus, MD | 1992 | 26 | 4:00–6:00 p.m. | 58 | 11 | 31 | 42 | 1,020 | RBA |
| 0.3 | 12 | Wheaton, MD | 1992 | 52 | 4:00–6:00 p.m. | 38 | 10 | 52 | 62 | 3,835 | RBA |

Average Pass-By Trip Percentage: 42

“—” means no data were provided

Figure 5: Tables from ITE Trip Generation Handbook 3rd Edition

The ITE data shows the average non-pass-by trip percentages were 42% in the AM peak period and 58% in the PM peak period. If the three sites in Chicago are excluded, the non-pass-by trip percentage for the PM peak period is 48%.

This equates to no more than half of the trip generation for the site being new trips on Great South Road, or about 30 trips per hour in the peak hour (300 trips per day). This is equivalent to an increase in traffic on Great South Road of approximately 7%. The average daily traffic on a road is expected to vary by approximately 10% from typical volumes, so an increase of 7% is not considered a significant change in traffic volume.

4.3. Proposed Vehicle Crossings

The site layout includes two vehicle crossings on Great South Road. The existing vehicle access points via Market Street and Church Street will be removed. Opposite the site on Great South Road is the Pokeno Hall, a carpark and Church Street. An existing service station and garage (G.A.S.) is located on the eastern corner of Market Square.

The figure below shows the vehicle crossing locations relative to the existing crossings and intersections. The northernmost access (A) will be for entry only. The southernmost access (B) will be two-way for entry and exit. Vehicle crossing A and B are approximately 21m apart.



Figure 6: Existing and Proposed Accesses

The PDP Rule 14.12.1.1 states “on a site with legal access to two roads, the activity only accesses the road with the lower classification in the road hierarchy”. Church Street (north of Great South Road) is unformed and is unlikely to be suitable for formation as a road without an extensive visibility splay across the property at 80 Great South Road. The property currently has access to Market Street across Market Square. Providing access via Market Street (to create a one-way circulation through the site) is not considered appropriate due to the adjacent left turn slip-lane into Market Street and potential loss of amenity in Market Square.

For the proposed development it appears that access directly to Great South Road is the most practicable option. If the property were to be developed for a different land use with lower trip generation it may be possible to use the existing access via Church Street and/or Market Street.

4.3.1. Vehicle Crossing Dimensions

The ODP allows for a maximum crossing width of 6.0m at the boundary and 7.0m at the kerb. Crossing A is 6.0m wide at the boundary and 7.8m wide at the kerb. If the additional widening (to accommodate the swept path of the fuel delivery tanker) is included, the crossing is 6.5m at the boundary and 9.4m at the kerb. Crossing B is 7.0m wide at boundary and 8.8m wide at kerb.

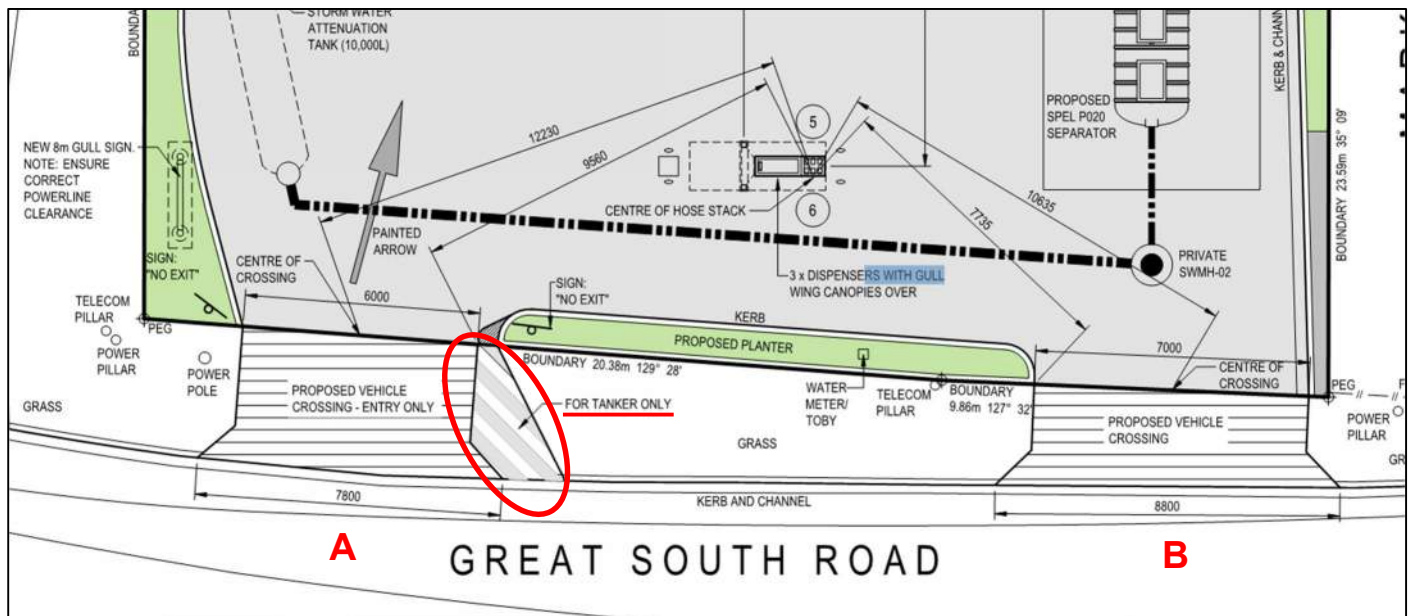


Figure 7: Proposed Vehicle Crossing Dimensions (Drawing 2998-B03, Rev F)

As shown below in Section 4.3.3 there is limited sight distance for vehicles exiting crossing A. The proposal includes signs and markings to reinforce crossing A as “Entry Only”. However, we are concerned that the wide crossing may encourage vehicles to exit at crossing A, because it appears wide enough for two-way use, and vehicles may enter the site at higher than appropriate speeds—increasing the risk of vehicle-vehicle conflict at the crossings.

Raised and textured coloured surface treatments are used in a range of situations to provide additional delineation of vehicle spaces, typically to reinforce pedestrian spaces or pedestrian priority. We note that some service stations use a contrasting raised and textured surface to define the appropriate vehicle path whilst providing easily traversable areas to accommodate the swept paths of large and long vehicles. We have included an example in the figure below showing a section of raised red surfacing and hatched markings.



Figure 8: Example of contrasting raised surfacing with hatch markings (entry to Z Service Station, Onewa Road)

This type of treatment would mitigate concerns about vehicle discipline using the entry at Crossing A to some extent. We suggest the use of raised and textured coloured surfacing (minimum 25mm high) to be applied at Crossing A. Hatched marking alone would not alleviate our concerns.

We consider it likely that the site will operate with predominantly one-way traffic flow – entry at Crossing A and exit at Crossing B. We suggest that Crossing B be signed and marked as “Exit Only” and treated with raised and textured coloured surfacing (minimum 25mm high) as recommended for Crossing A. This will improve flow on site and minimise the likelihood of vehicle-vehicle conflict.

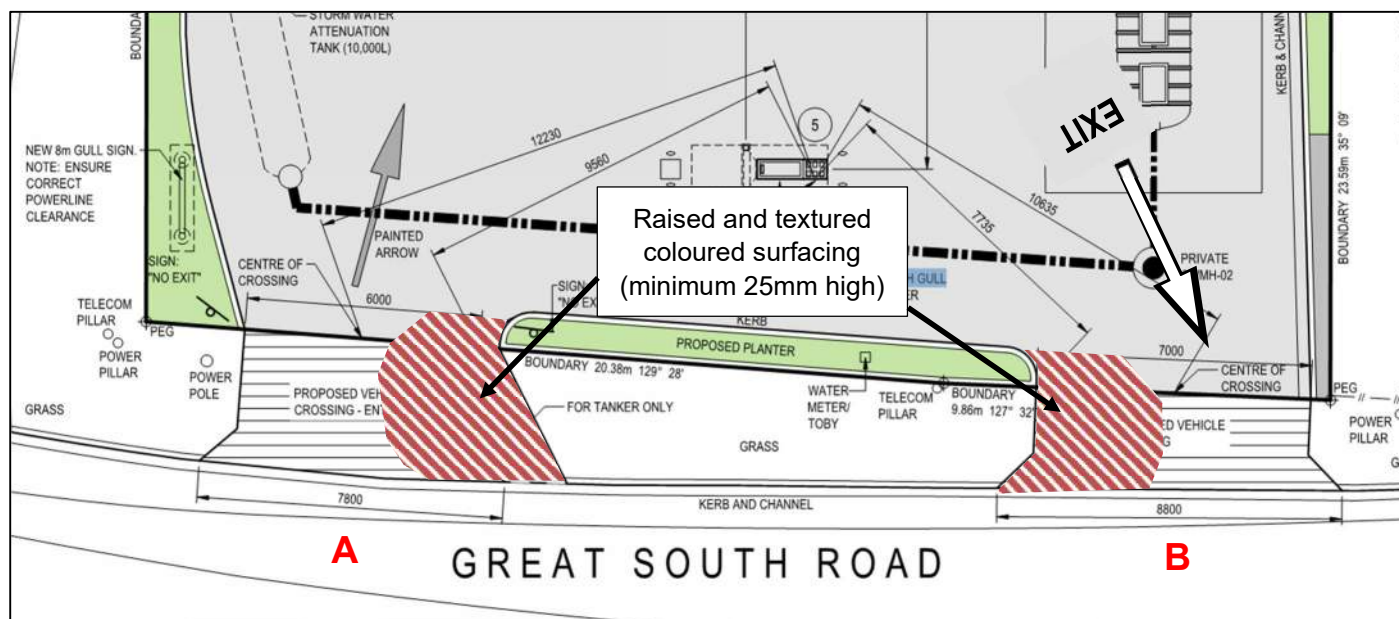


Figure 9: Possible Vehicle Crossing Configuration, Showing Delineation of Proposed Crossings (Drawing 2998-B03, Rev F)

Due to the short distance between the proposed vehicle crossing and the first fuel pump, we consider it necessary for the delineation treatment to extend to the road edge. If pedestrian or cycling paths are to be provided in the future, the vehicle crossing treatments may need to be revised (i.e. surfacing removed where the footpath is created).

4.3.2. Separation Distance

The separation distances to the proposed vehicle crossings (marked A and B) are shown in the figure below.

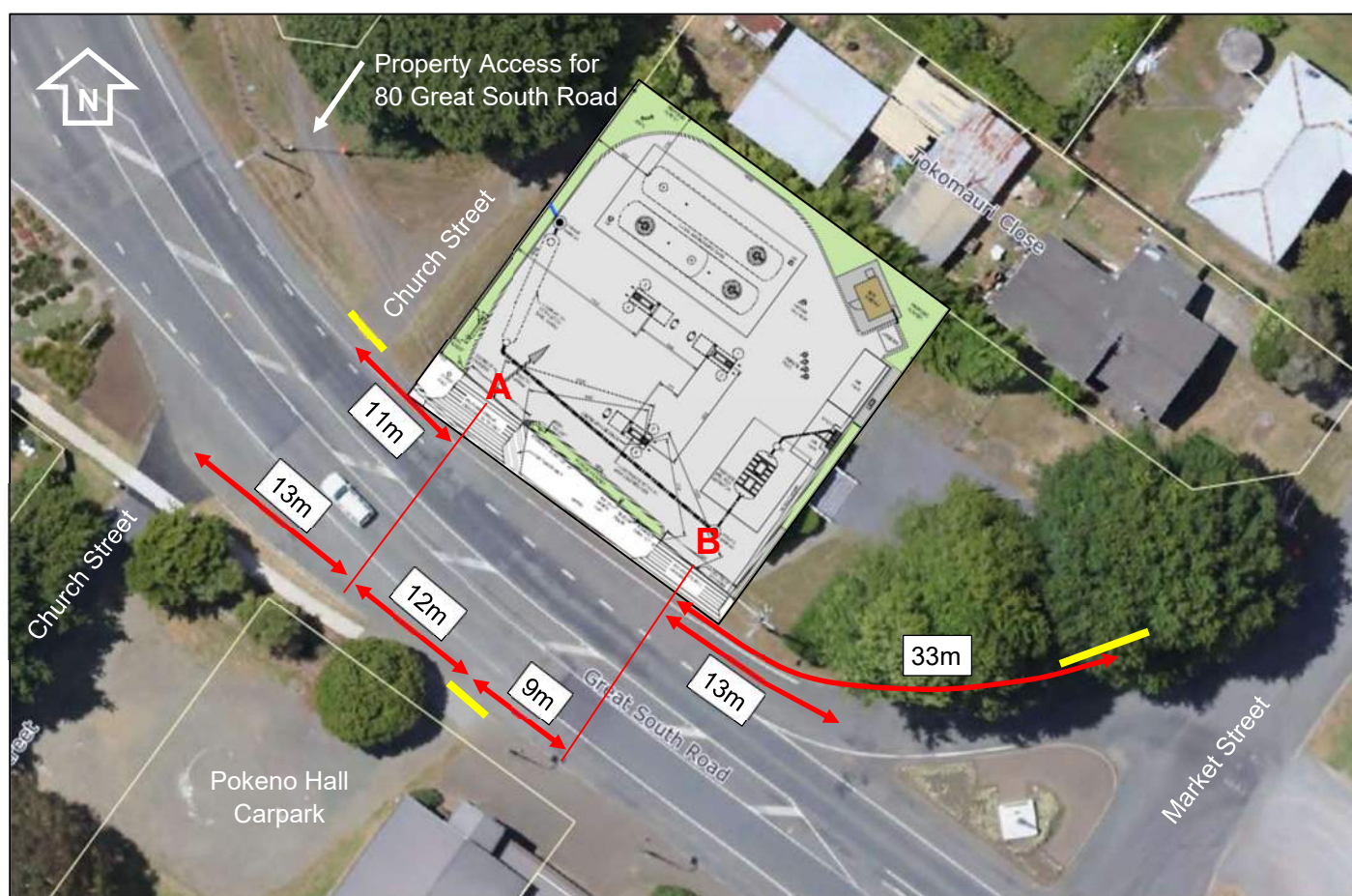


Figure 10: Separation Distances to Existing Vehicle Crossings (marked yellow) and Intersections

Table 9.B⁵ of the ODP specifies the minimum distance between crossings as 15m and requires 20m on the approach to a side road, or 30m on the departure from a side road. Table 14.12.5 of the PDP sets out the separation distances based on road hierarchy, being 15m between crossings and 30m to a side road for a collector or local road.

The separation distances are summarised in the table below.

| Existing Crossing or Intersection | Distance to Proposed Vehicle Crossing | |
|-----------------------------------------|---------------------------------------|-----|
| | A | B |
| Pokeno Road | 52m | 73m |
| Church Street (Unformed) | 11m | 32m |
| Church Street | 15m | 37m |
| Carpark | 12m | 9m |
| Market Street Slip Lane | 34m | 13m |
| Market Square Existing Vehicle Crossing | 54m | 33m |
| Market Street | 66m | 45m |

Table 3: Separation Distances to Proposed Vehicle Crossings

The proposed vehicle crossing locations do not satisfy the separation distance requirements of the District Plans. The separation distance to Pokeno Road and Market Street are satisfactory. However, we note that

⁵ For more than 30 vehicle movements per day (Part 9, Franklin Section, ODP)

proposed vehicle Crossing B is positioned within the diverge taper for the left turn slip lane into Market Street (north), with only 13m separation.

The slip lane provide access for vehicles turning left from Great South Road into Market Street, avoiding the First World War memorial located adjacent to the carriageway (on the splitter island). From a road safety perspective, the location of the memorial is inappropriate. People visiting the memorial must cross the road to access it and will be very close to traffic on Great South Road when reading the names and information displayed on the memorial.

It does not appear necessary to have a left turn slip lane in this location. If the memorial was relocated the slip lane could be closed and the kerb realigned to provide a standardised cross-roads intersection, consistent with the scale and form of other intersections in the town centre. This would simplify the intersection form, reducing the number of conflict points, improve pedestrian safety and enhance the public space.

We suggest that Council considers relocating the memorial and simplifying the Market Street intersection as part of any town centre streetscape works, irrespective of the proposed development at 72 Great South Road.

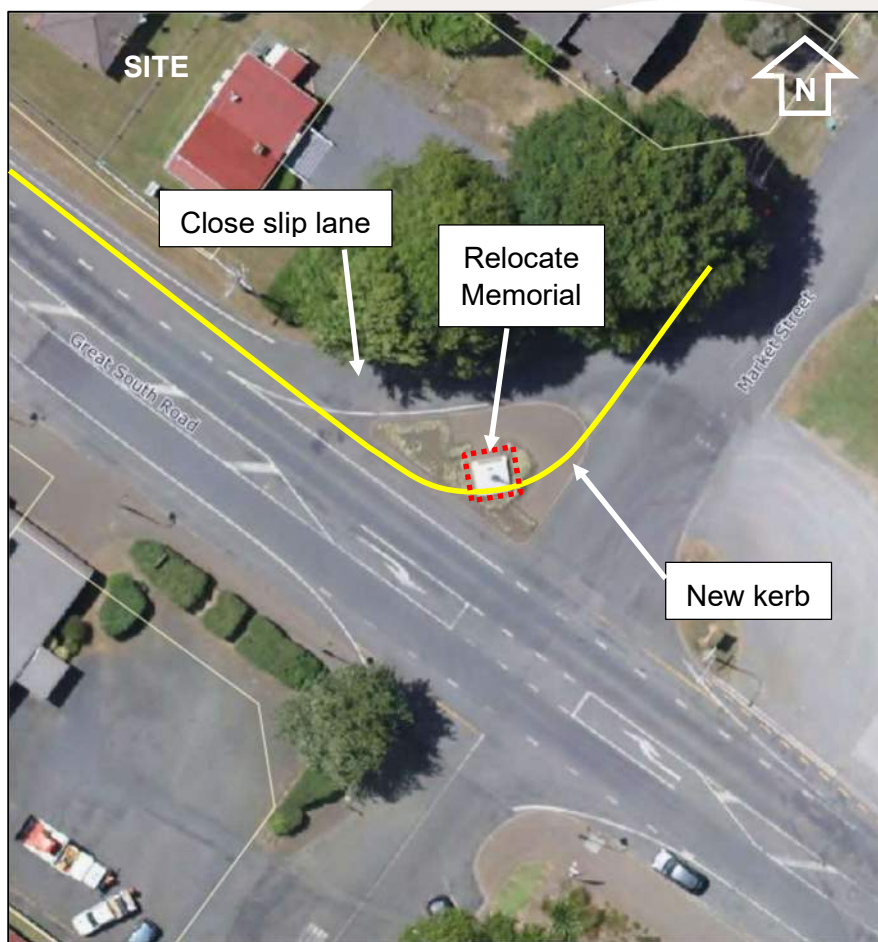


Figure 11: Possible Slip Lane Closure Option for Future Pokeno Streetscape Upgrade/Market Square Development

The TIA comments that the vehicle crossing to Church Street is unformed and is currently only used to access 80 Great South Road. This vehicle crossing will need to remain open and active if the proposal proceeds.



Figure 12: Existing Vehicle Crossing for Church Street and Property Access for 80 Great South Road
 Church Street south of Great South Road provides access to five residential dwellings.



Figure 13: Looking south from Great South Road, down Church Street



Figure 14: Community Carpark opposite the Proposed Development Site

We have estimated the existing turning movements onto Great South Road and compared with the proposed turning movements at the proposed vehicle crossings in the table below.

| Location | Use | Vehicle Movements |
|-----------------------|-----------------------------------------------------------------------------------------------|-------------------|
| Existing | | |
| Church Street (south) | 5 residential dwellings Average about 10 trips per day/dwelling Primarily at peak hours | About 5-10 tph |
| Church Street (north) | 1 residential dwelling Average about 10 trips per day/dwelling Primarily at peak hours | About 1-2 tph |
| Community Carpark | Approx. 690m ² Assume 30 cars when full Primarily weekends and off-peak | About 30 tph |
| Existing Total | | 12-42 tph |
| Proposed | | |
| Crossing A | Entry Estimated peak hourly volume | 25 tph |
| Crossing B | Entry and exit Estimated peak hourly volume | 35 tph |
| Proposed Total | | 60 tph |

Table 4: Estimated Trips from Existing Vehicle Crossings

In the discussion regarding trip distribution, the TIA notes “the highest turning movement will likely be about 15 tph at any one access.” This appears to be in contradiction to the turning volumes given in TIA Figure 4 “Turn Flows at Site Accesses” which shows 25 tph at crossing A and 35 tph at crossing B.

In our opinion, it is likely that regular users of the service station will enter through crossing A and exit through crossing B to avoid having to manoeuvre and u-turn on-site. This means that the right turn movement into crossing A could be higher than the estimated 25 tph given in the TIA.

The proposal will result in a significant increase in turning movements to and from Great South Road, increasing the potential for conflict between opposing vehicles using the flush median for turning space – particularly for vehicles accessing the Community Carpark. The vehicle crossing for the Community Carpark is located opposite the proposed development, between Crossing A and Crossing B. We assume the peak vehicle movements at the Community Carpark are most likely to occur during weekends and off-peak periods.

The lack of adequate separation to adjacent vehicle crossings limits the available queuing space within the flush median. There is potential for increased vehicle-vehicle collisions if peak turning movements to and from the adjacent properties were to coincide with peak trips to the proposed development.

Despite the significant increase in turning movements, the peak turning flow is likely to be one vehicle per minute (60 tph) and the safety and efficiency effects are likely to be no more than minor.

4.3.3. Sight Distance

The available site distance from each of the proposed crossings is shown in the figures below. The red arrows indicate the extent of available site distance and the yellow arrows indicate the potential sight distance if obstructions (vegetation, fencing, signage, etc) are placed in the berm or near the roadside.

If the Pokeno Road intersection is upgraded and the berm width outside 72 Great South Road is reduced (refer Section 4.1), the sight distance from the proposed vehicle crossings is likely to be negatively affected due to the driver being positioned further back into the site when checking for approaching vehicles. Removing the slip-lane (Section 4.3.2) and creating a wider berm should have a positive effect.

Note the vegetation located within the road reserve (circled red) had no foliage at the time of our site visit and does not currently obscure sight distance. If these trees grow foliage, they are likely to block sight distance.

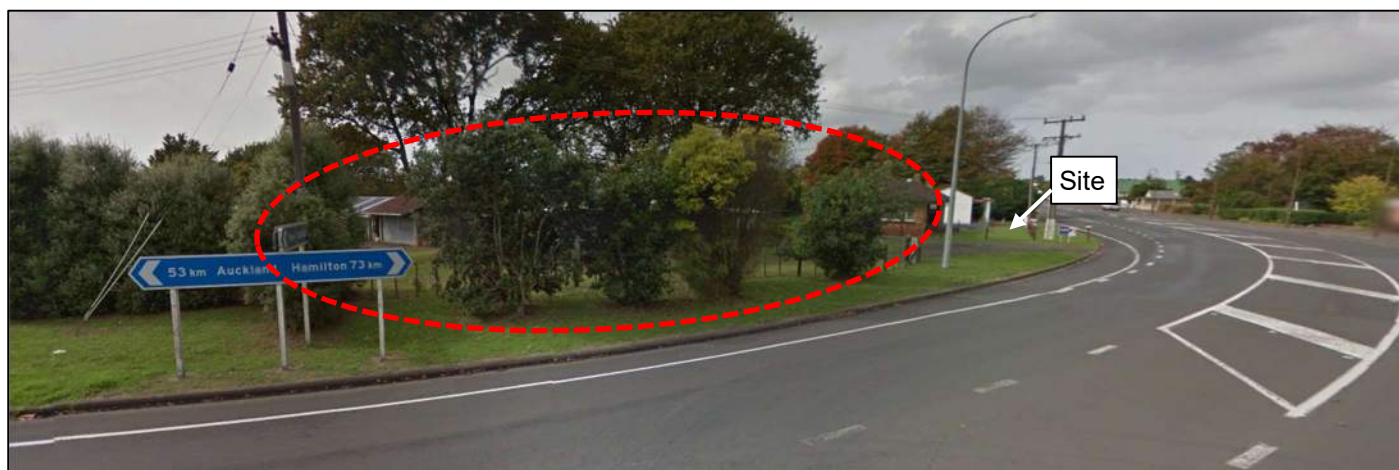


Figure 15: Roadside Vegetation (image: Google Street View, April 2012)



Figure 16: Sight Distance from Crossing A



Figure 17: Sight Distance from Crossing B

The available sight distances are summarised in the table below.

| Vehicle Crossing | Sight distance north (right) | Sight distance south (left) |
|--------------------------|------------------------------|-----------------------------|
| A ("west access" in TIA) | 50m | >150-300m |
| B ("east access" in TIA) | 55m | >150-300m |

Table 5: Sight Distance at Proposed Vehicle Crossings

The PDP Table 14.12.5.3 requires 105m sight distance for a vehicle crossing generating more than 40 vehicle movements per day in an urban area with a speed environment of 60km/h. Where the operating speed is 50km/h the sight stance requirement reduces to 80m.

RTS 6⁶ requires 115m sight distance for high volume vehicle crossings (more than 200 vehicle manoeuvres per day) on a collector road with a 60km/h operating speed. Where the operating speed is 50km/h, the sight distance requirement reduces to 90m.

Sight distance to the south (looking left) from both proposed vehicle crossings is in excess of 150m and complies with the requirements of the ODP. Neither of the proposed crossings has sufficient sight distance to the north (looking right). The available and required sight distances are shown in the figure below.

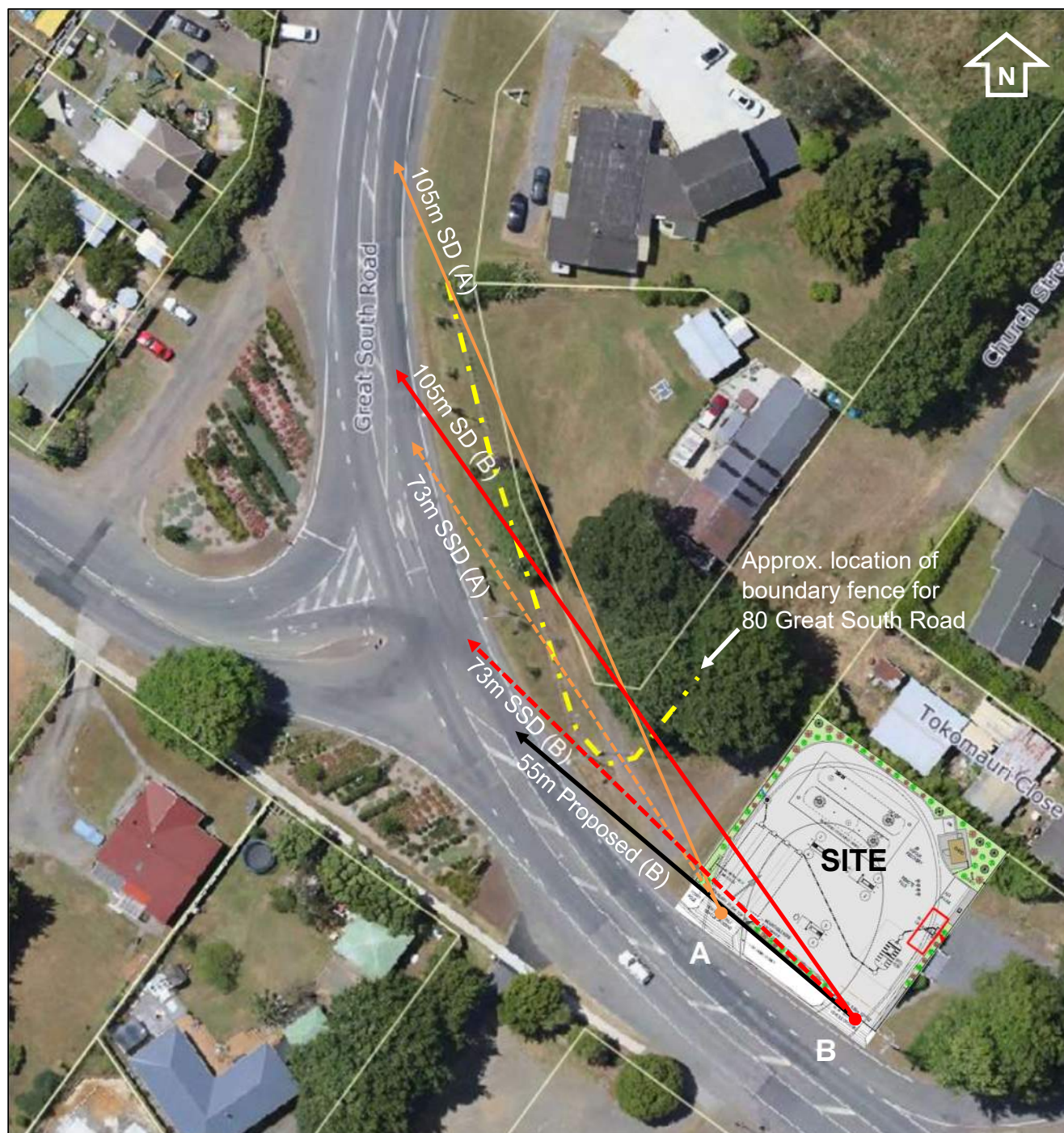


Figure 18: Sight Distance Requirements for the Proposed Vehicle Crossings

⁶ RTS 6 Guidelines for Visibility at Driveways, NZ Transport Agency

We also note that the boundary fence at 80 Great South Road is located within the road reserve.

Crossing A does not provide the required 105m of unobstructed sight distance to the north. However, the proposal is for this vehicle crossing to be marked as Entry Only (no exit). The sight distance required for an entering vehicle is the stopping sight distance as measured from the position of a right-turning vehicle waiting on the flush median (Austroads⁷).



Figure 19: Approximate Sight-Line of Right-Turning Vehicle

We estimate the sight distance for right-turning vehicles waiting to enter crossing A to be about 65-70m.

For an operating speed of 60km/h, the Safe Stopping Distance (SSD) required is 73m⁸. This means the actual shortfall in sight distance would be no more than 8m at Crossing A. The effect of an 8m shortfall in sight distance is the potential for a vehicle-vehicle collision with an impact speed of less than 30km/h. At an impact speed of 30km/h the risk of injury to vehicle occupants is low - crashes more commonly result in vehicle and property damage.

Crossing B does not have the required 105m of unobstructed sight distance to the north, relocating the fence at 80 Great South Road would improve the sight distance to approximately 90-100m which is considered acceptable for a 50km/h speed environment. SSD of 73m is achieved for this crossing.

The supplied plans indicate the site will have screening planting along the Great South Road frontage and the western boundary with the unformed section of Church Street. These plantings could grow in excess of 1m high and obstruct sight distance from the vehicle crossings, reducing the available sight distance to about 55m (refer Figure 18). If there was no screen planting within the site, the shortfall in sight distance would be unchanged as the roadside vegetation and fence at 80 Great South Road would still block the sightlines. (As mentioned above the sightline within the road reserve is about 10m short of that required by the District Plan for an operating speed of 60km/h)

We recommend no screening planting is used in the areas circled red in the figure below and that any planting in these areas is maintained to a low height or limited to ground cover plants only. The planting within the site will need to be maintained to ensure sight distance for crossing B is not obstructed.

⁷ Austroads Guide to Road Design Part 4A Unsignalised and Signalised Intersections

⁸ Austroads Guide to Road Design, Part 3: Geometric Design, Section 5.3 Stopping Sight Distance (SSD) (V=60km/h, R_T=2 seconds, d=0.36, a=0%)

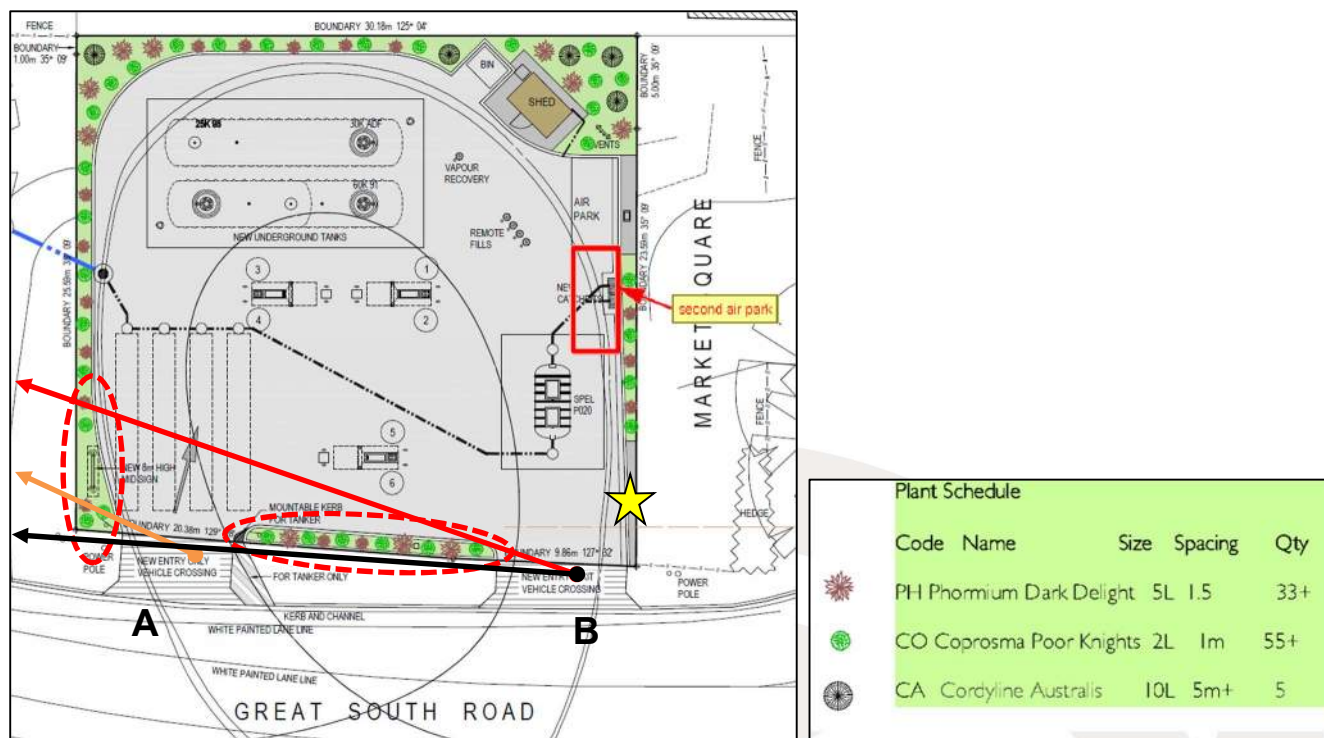


Figure 20: Landscaping Plan and Plant Schedule, Showing Sight Lines from Figure 18 (Drawing 2998-B01, Rev A)

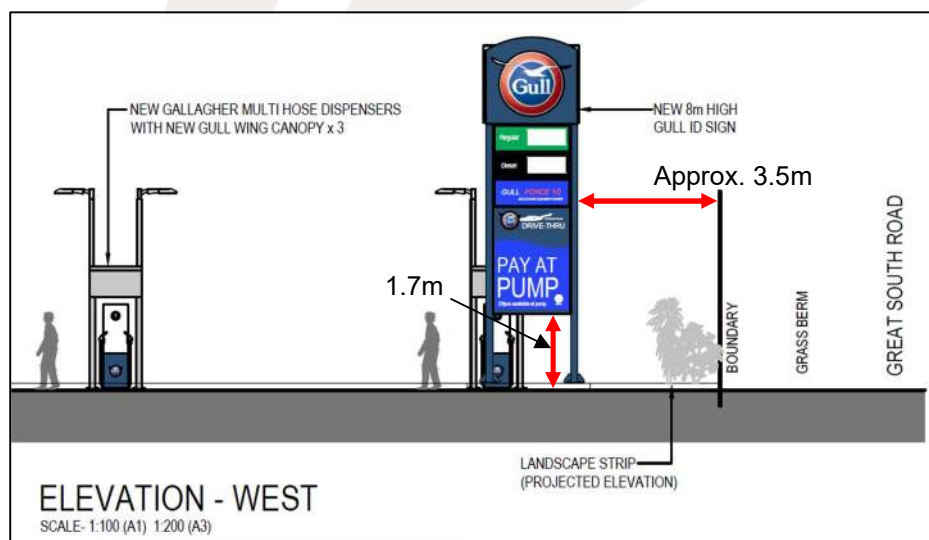


Figure 21: Proposed Sign (Drawing 2998-09, Rev B)

The proposed Gull ID sign is located near crossing A, approximately 3.5m from the boundary with Great South Road. The location of the sign obstructs sight distance for drivers exiting crossing B. We recommend the sign be relocated to the southern boundary (as indicated by the yellow star in Figure 20 above) to ensure sight distance for crossing B is maximised and unobstructed.

4.4. Parking

The ODP requires 2 parking spaces per air hose. Table 51.B, Note 1 states: Parallel parking spaces (Parking angle = 0) shall be 6.0m long except where the end of the space is not obstructed, in which case the length of a space may be reduced to 5.0m.

The site plans show two parking spaces beside the air hose. The spaces are 2.5m wide and 5.0m long. The kerbing and rubbish bin adjacent to the rear carpark will obstruct a vehicle trying to manoeuvre into or out of the space. The rear parking space should be 6.0m long.

4.5. Queuing

The ODP requires that fuel dispensers are located a minimum of 12m from the vehicle crossing (measured from the midpoint of the crossing on the boundary). Crossing A is 12.2m from the nearest fuel dispenser and crossing B is 10.6m (refer Figure 7). A shortfall of less than 1.4m is unlikely to result in significant adverse effects related to on-site queuing.

RTS 13⁹ comments that “it is desirable that queuing vehicles do not block any driveway because this may cause a conflict between entering vehicles and traffic on the frontage road or obstruct pedestrian flows on footpaths.” To minimise potential conflict, RTS 13 recommends pumps are not located within 4.5m of the boundary and 7.0m of the vehicle crossings. The proposal complies with the advice in RTS 13.

The PDP does not require any on-site queuing space where less than three parking spaces are provided. However, with six fuelling pumps and two parking spaces at the air hose, there could be up to eight vehicles “parked” on site at one time. PDP Table 14.12.5.12 requires a minimum queuing length at each vehicle entrance of 5.5m for sites with 3–20 parking spaces. The proposal complies with the requirements of the PDP.

The TIA indicated there is enough queuing space on site for about 11 light vehicles. However, we note that the queuing vehicles may obstruct the vehicle crossings, making it difficult for a vehicle to exit when other vehicles are queuing, particularly when the fuel delivery tanker is on site. Congestion on-site may increase the likelihood of vehicles exiting via Crossing A.

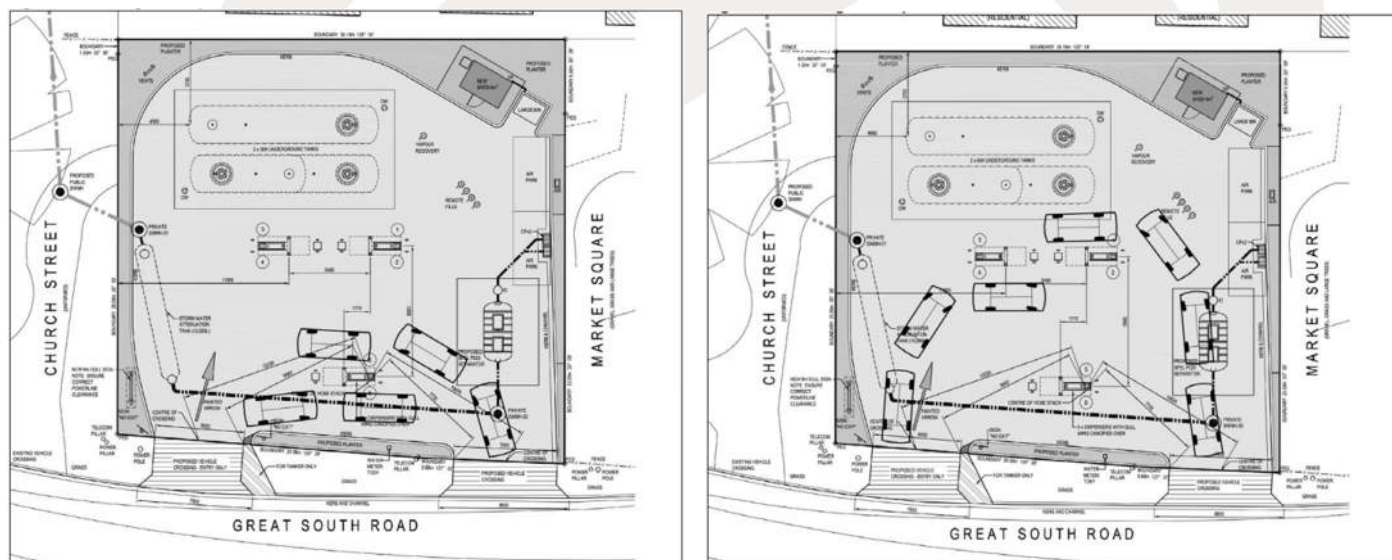


Figure 22: Queuing Diagrams (from TIA Figure 7 and 8)

The trip generation estimation indicates the six pumps will be required to serve up to 60 tph. This equates to approximately five vehicles per pump and an average visit duration of 12 minutes per vehicle if no queuing is to occur. This appears to be a reasonable rate of turnover for a service station and given the capacity for some on-site queuing.

4.6. On-site Manoeuvring

The TIA notes that Gull New Zealand has confirmed the fuel delivery tanker will arrive from the south, turn right into the site and turn right to exit. If the tanker were to arrive from the north, it would have to divert via local streets to approach the site from the south.

The figures below show the swept paths of a quad-axle semi-trailer tanker.

⁹ RTS 13 Guidelines for Service Stations, NZ Transport Agency, March 1996

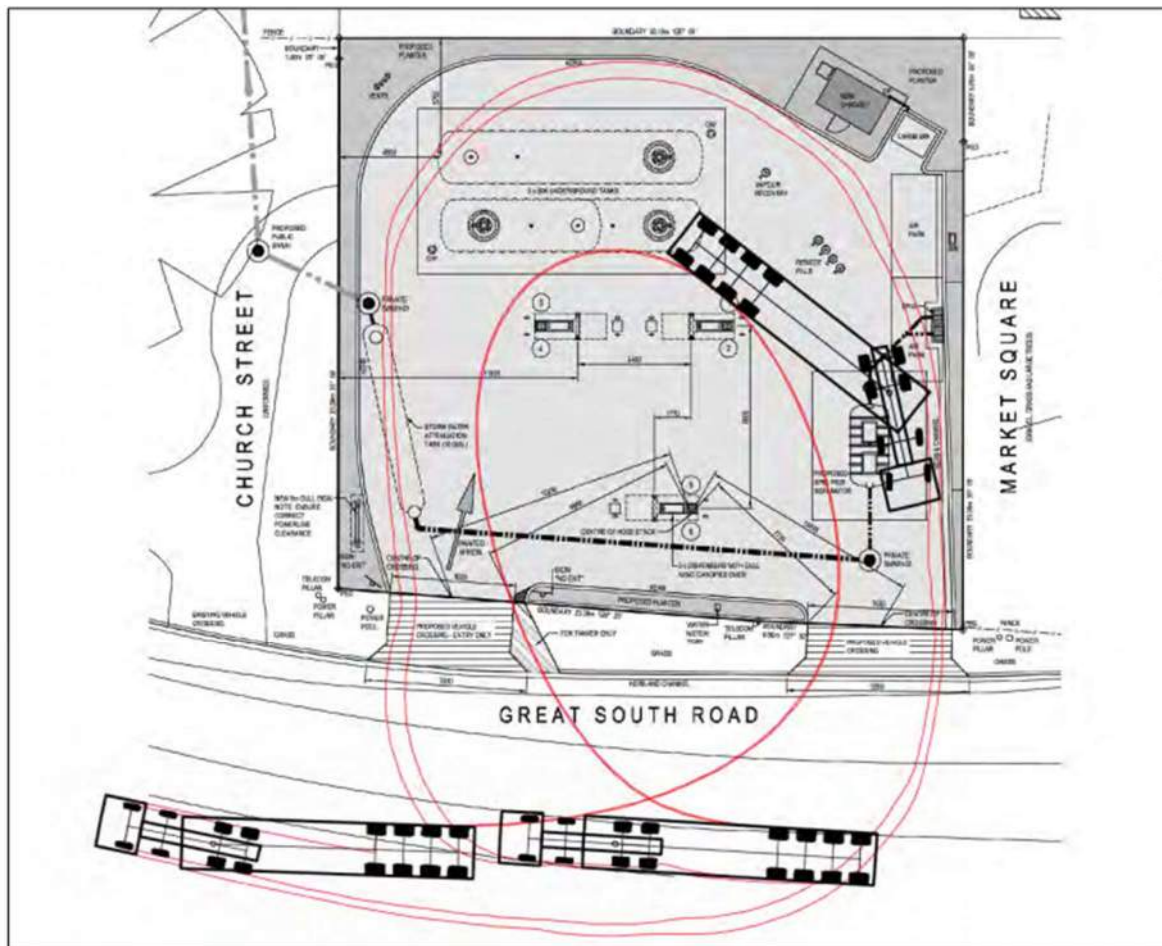


Figure 23: Swept Path of Quad-Axle Semi-Trailer Tanker Right Turn Entry and Exit (from TIA Figure 5)

The figure above shows the use of additional widening to Crossing A to allow for the swept path of the tanker entering the site.

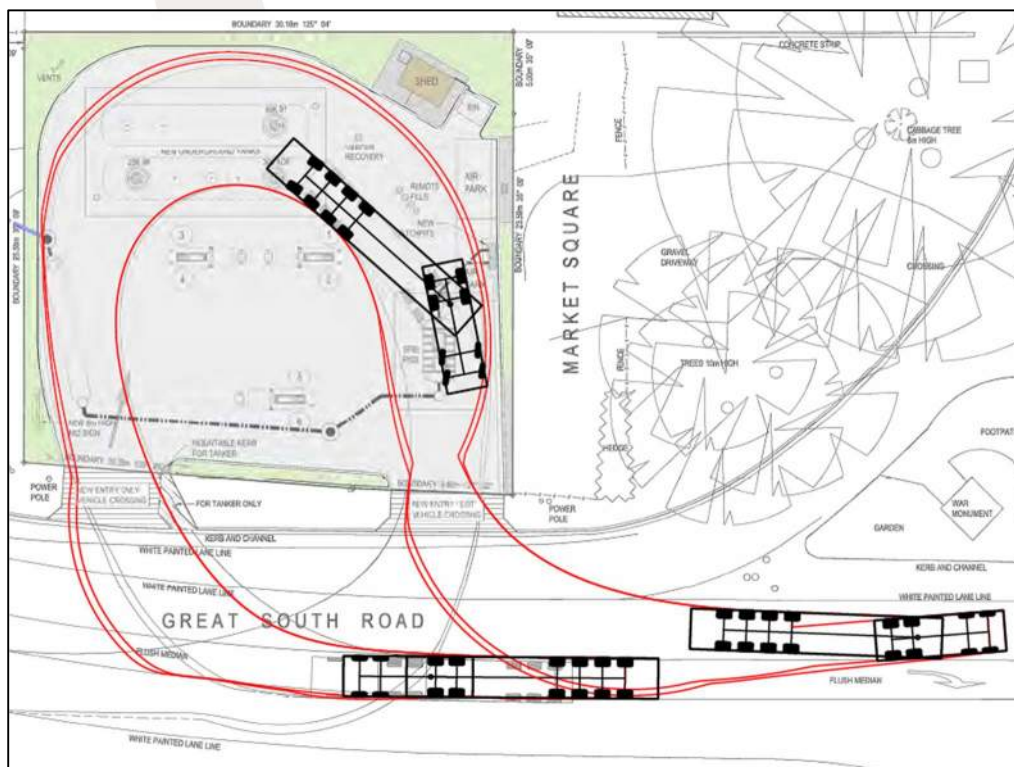


Figure 24: Swept Path of Quad-Axle Semi-Trailer Tanker Left Turn Exit (from TIA Figure 5)

As discussed in Section 4.5 there is some on-site queuing space, but there is potential for manoeuvring space and vehicle crossings to become obstructed by queuing vehicles especially when the fuel delivery tanker is on-site. However, the tanker visits are likely to be infrequent and in the off-peak traffic periods.

The tanker can turn left to exit the site (as shown in Figure 24) if the flush median space is used. This is acceptable for periods of low traffic flow on Great South Road, but less desirable during peak traffic periods. Turning right to exit the site may be difficult during peak traffic periods and may rely on the courtesy of approaching drivers to allow the tanker to turn onto Great South Road. Clear sight distance to the north is required to minimise the safety risk for drivers.

An option to mitigate turning effect may be to specify right turn entry and right turn exit only for fuel delivery tankers. It is preferable that a tanker arriving from the north can loop around the village and approach the site from the south. Similarly, a tanker departing towards the south should be able to turn right from the site and loop around the village to head south. Consideration needs to be given to the potential effects of tankers circulating around the village to meet the entry and exit restrictions.

We recommend that the Applicant consult with Waikato District Council to identify a preferred heavy vehicle route for tankers to circulate on that allows them to approach the site from the south and depart to the north, or south. We suggest using the industrial streets as shown in the figure below. These streets and intersections are designed for long and large vehicles, making this a suitable heavy traffic route which avoids residential streets.

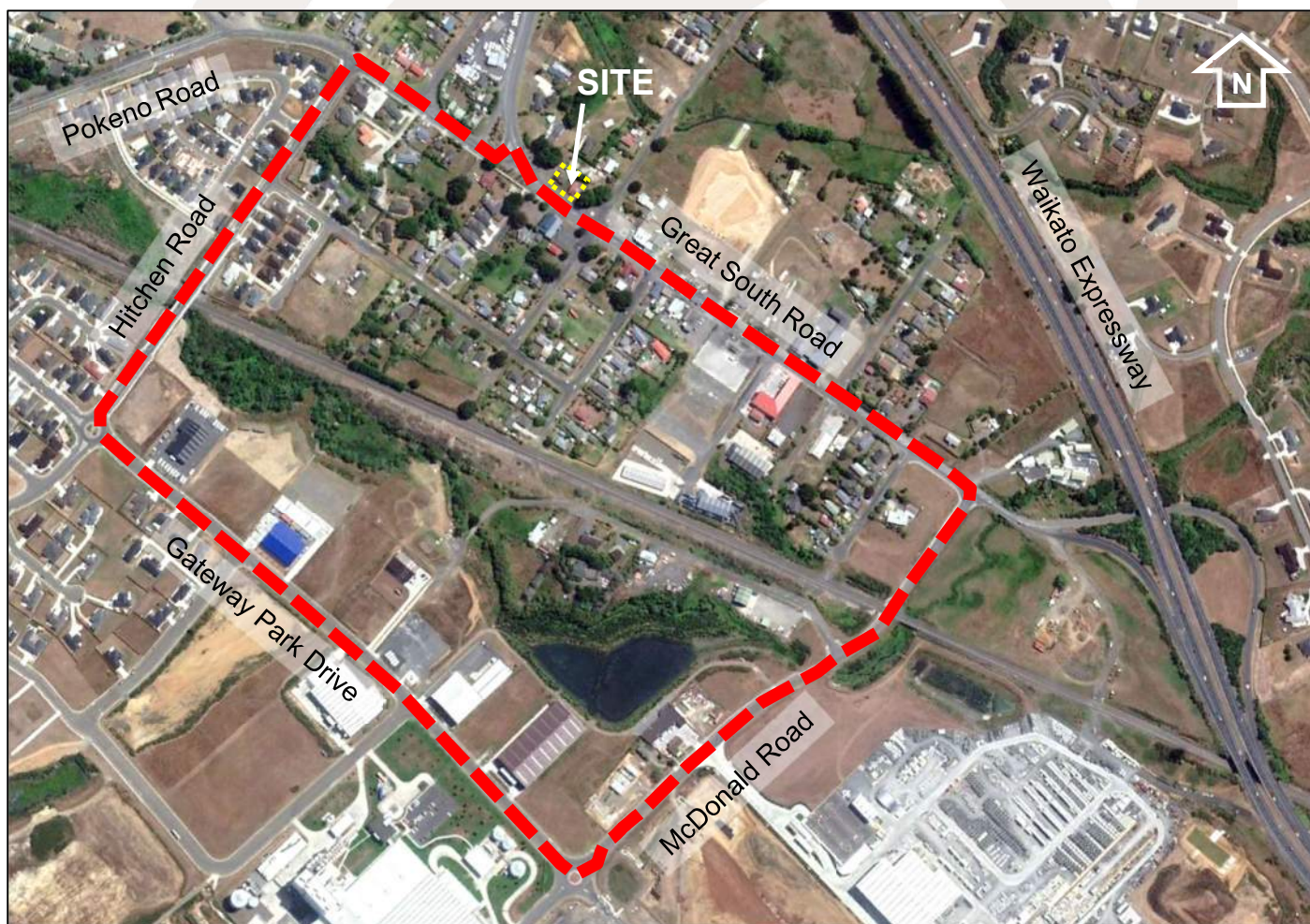


Figure 25: Suggested Heavy Vehicle Circulation Route

The Applicant would need to ensure all tanker drivers are aware of the preferred circulation route in case they approach the site from the north or depart towards the south. Requiring a Site Management Plan to specify the access requirements for heavy vehicles (both the designated heavy vehicle route, and right turn entry and exit) would encapsulate the vehicle movement restrictions and provide a way to manage effects of large vehicles driving along residential streets.

5. Effects Related to Transport

The transport effects of the proposed development relate to safety and efficiency. We have not considered the consequential effects of traffic such as visual effects and noise effects. The following sections comments on the key transport aspects and effects for the proposed development.

| Effect | Discussion | Significance and Extent of Effects | Recommendation |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety – Vehicle crossings | <p>The proposed vehicle crossings are on the major road frontage. The PDP requires property access to be from the minor road.</p> <p>The wide vehicle crossing encourages vehicles to exit at Crossing A.</p> <p>The proposed vehicle crossings have sight distance deficiencies which increases the likelihood of vehicle-vehicle collisions.</p> <p>The proposed crossings do not meet the separation distance requirements.</p> <p>The proposed development will significantly increase the turning movements to/from Great South Road in the length between Pokeno Road and Market Street, increasing the likelihood of vehicle-vehicle collisions.</p> | <p>Moderate.</p> <p>Effects impact all road users on Great South Road between Pokeno Road and Market Street.</p> | <p>Unlikely to be practical to modify vehicle crossing locations for the proposed development.</p> <p>Not practical to reduce vehicle crossing dimensions due to swept path of fuel delivery tanker.</p> <p>Delineate crossings with raised and textured coloured surfacing (min. 25mm high).</p> <p>Use signage and markings to make crossing B “Exit Only”.</p> <p>Ensure proposed signage does not obstruct sight distance for the vehicle crossings.</p> <p>Ensure proposed planting does not obstruct sight distance for the vehicle crossings.</p> <p>Remove vegetation from roadside berm (opposite Pokeno Road).</p> <p>Relocate the boundary fence of property at 80 Great South Road.</p> |

| Effect | Discussion | Significance and Extent of Effects | Recommendation |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety – On-site | <p>The rear carpark space is not long enough.</p> <p>On-site space for queuing and manoeuvring appears adequate. Occasional “jams” may occur during exceptional peak times or when the fuel delivery tanker is on-site, but these events are expected to be infrequent and minor.</p> <p>Fuel delivery tanker must enter by turning right. Potential berm or property damage if a driver mistakenly attempts to enter by turning left.</p> <p>No swept path provided to show the tanker can turn left when exiting.</p> | <p>Low.</p> <p>Effects could include damage to shoulders, berms and adjacent property.</p> | <p>Extend rear carpark space to 6.0m long.</p> <p>Not practical to accommodate left turn entry for fuel delivery tanker (vehicle crossing already widened).</p> <p>Provide a turning path to show the fuel delivery tanker turning left to exit.</p> <p>Establish a preferred circulation route to ensure tanker drivers can arrive or depart in either direction.</p> |
| Safety – Great South Road | <p>There will be an approximate 7% increase in traffic on Great South Road.</p> <p>Increase in turning movements increases the likelihood of vehicle-vehicle collisions. However, peak turning volume equates to one vehicle per minute (60 tph) and is not considered a significant change in traffic.</p> | <p>Low.</p> <p>Effects impact all road users over a short length of Great South Road.</p> | <p>There does not appear to be a practical solution to avoid or mitigate the safety effects. However, the effects are likely to be no more than minor.</p> |
| Efficiency – Road network | <p>Comments as above for safety aspects on Great South Road.</p> <p>Efficiency affected by vehicles slowing and turning into the site. Efficiency effects are likely to be noticeable, but infrequent.</p> | <p>Low.</p> <p>Effects impact all road users.</p> | <p>None.</p> |
| Active transport and recreation | <p>There is no footpath on the eastern side of Great South Road (on the site frontage) and there are no marked cycling facilities in the vicinity.</p> <p>The proposed development should not preclude the addition of footpaths and cycling facilities in the future.</p> | <p>Negligible.</p> <p>Effects impact all active transport users and recreational walkers, runners and cyclists.</p> | <p>None.</p> |

| Effect | Discussion | Significance and Extent of Effects | Recommendation |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Construction effects | <p>The potential for adverse effects from construction related traffic include delays, crashes, dust and noise. These effects could be mitigated through implementation of an approved construction traffic management plan that includes temporary traffic management.</p> <p>The trip generation and traffic effects from construction activities are expected to be of short-term duration and not considered significant.</p> | <p>Low.</p> <p>Temporary effects related to traffic impact all road users.</p> | Require a Construction Traffic Management Plan and a Temporary Traffic Management Plan. |

Table 6: Appraisal of Potential Transport-related Effects

6. Avoiding or Mitigating Actions

Without mitigation the potential safety effects from the non-compliant sight distance and vehicle manoeuvring would be unacceptable.

The potential safety effects arising from the non-compliant sight distance and limited on-site space could be mitigated by changing the design and through conditions of consent. The following mitigation would be required:

- = Remove vegetation from roadside berm (opposite Pokeno Road);
- = Relocate the boundary fence at 80 Great South Road to the property boundary;
- = Locate any signage for the proposed development on the southern boundary;
- = Maintain planting within the proposed development to ensure unobstructed sight distance of 90m (minimum) for crossing B;
- = Extend rear carpark space to 6.0m long;
- = Provide delineation of vehicle paths at crossing A and crossing B using raised and textured coloured surfacing (minimum 25mm high) subject to approval by Waikato District Council;
- = Use signs and markings to make crossing B "Exit Only";
- = Consult with Waikato District Council on the preferred heavy vehicle circulation route;
- = Include the requirements for Gull ID signage location, vegetation maintenance, right-turn entry and exit requirements for fuel delivery tankers, and a heavy vehicle circulation route in the Site Management Plan; and
- = Provide a Construction Traffic Management Plan including a Temporary Traffic Management Plan.

As proposed, we consider the effects of the sight distance shortfall to be more than minor. If the suggested mitigation is carried out (i.e. remove roadside vegetation, relocate 80 Great South Road fence onto boundary, locate Gull ID sign on southern boundary and maintain on-site planting to maximise sight distance), the effects relating to the minor shortfalls in sight distance are considered to be minor or less.

Identifying a preferred heavy vehicle circulation route such as shown in Figure 25 (Great South Road, Pokeno Road, Hitchen Road, Gateway Park Drive, McDonald Road), provides a way to manage effects of large vehicles driving along residential streets.

We suggest using a Site Management Plan to specify the following:

- = Right turn entry and right turn exit only for fuel delivery tankers;
- = Preferred heavy vehicle circulation route for fuel delivery tankers;
- = Gull ID signage location;
- = On-site vegetation management; and
- = Roadside vegetation management.

7. Conclusion

We have reviewed the Applicant's Traffic Impact Assessment, assessed the proposal against the requirements of the District Plans (refer Appendix 1) and have considered the potential effects related to transport.

The proposed development is likely to generate 600 vehicle movements per day (60 vehicle movements per hour) on Great South Road. It is expected that about 50% of the total trips attracted to the development will be from passing traffic already using Great South Road so there will be an additional 300 vehicle movements per day (30 vehicle movements per hour). The change in traffic may not be noticed on Great South Road due to typical variations in daily traffic. The increase in turning movements (estimated to be one vehicle per minute in a peak hour) is likely to be noticed but is not considered a significant change in traffic conditions.

There is potential for adverse safety effects on Great South Road related to sight distance restrictions for vehicles turning to and from the proposed development. Without mitigation these potential safety effects would be unacceptable.

We consider the effects related to sight distance can be mitigated by relocating the fence at 80 Great South Road to the property boundary, removing roadside vegetation opposite Pokeno Road, maintaining planting within the site, and relocating the proposed Gull ID sign.

We suggest that Council considers relocating the memorial and simplifying the Market Street intersection layout as part of any centre streetscape works within Pokeno Village, irrespective of the proposed development at 72 Great South Road.

If you have any queries, please do not hesitate to contact us.

Yours sincerely



Melanie Parsons
Civil/Transportation Engineer



Alastair Black
Transportation Engineer

Appendix 1: Assessment Against Requirements of District Plans

We have reviewed the transportation aspects of the proposal using the Franklin Section of the Waikato Operative District Plan (ODP), and Waikato Proposed District Plan (PDP).

| Rule | Assessment of Proposal |
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| PDP Rules – 14.12 Transportation | |
| <p>P1 Vehicle access for all activities.</p> <p>14.12.1.1</p> <p>1. All activities must comply with the following vehicle access conditions:</p> <p>a) The site has a vehicle access to a formed road that is maintained by a road controlling authority;</p> <p>b) The site has a vehicle access that is constructed to comply with the relevant requirements of Table 14.12.5.1 Figure 14.12.5.2, Table 14.12.5.3 and Figure 14.12.5.4 except:</p> <p>i) Rule 14.12.1.1(1)(b) does not apply where the separation distance requirements of Table 14.12.5.1. and Figure 14.12.5.2 cannot be achieved on a site's road frontage due to existing vehicle accesses on adjacent sites;</p> <p>c) No new vehicle access shall be created from Newell Road (south of Birchwood Lane);</p> <p>d) No access, access leg or right-of-way shall run parallel to any road within 30m of the road, except:</p> <p>e) On a site with legal access to two roads, the activity only accesses the road with the lower classification in the road hierarchy in Tables 14.12.5.5 and 14.12.5.6 (where the roads have the same classification, access is only to the road with the lower average daily traffic movements);</p> <p>f) New vehicle accesses / entrances are not to be constructed to any site from the following roads:</p> <p>i. Main Street, Huntly;</p> <p>ii. Jesmond Street, Ngaruawahia;</p> <p>iii. Bow Street, Raglan (James Street to Cliff Street);</p> <p>iv. George Street, Tuakau (Gibson Road to Liverpool Street);</p> <p>v. Great South Road, Pokeno (Selby Street to Market Street); and</p> <p>vi. Main Street, Te Kauwhata (Saleyard Road to Baird Avenue);</p> <p>and</p> <p>g) No new vehicle access shall be created within 30 metres of a railway level crossing.</p> <p>Note: Any new vehicle access (or additional land use utilising an existing vehicle access) on a limited access road or state highway will require the approval of the NZ Transport Agency, as the road controlling authority.</p> | <p>a) Complies</p> <p>b) <u>Does not comply</u></p> <p>Proposed vehicle crossings are within 15m of adjacent crossings and 30m of adjacent intersections.</p> <p>Proposed vehicle crossings have sight distance deficiencies.</p> <p>c) Not applicable</p> <p>d) Not applicable</p> <p>e) <u>Does not comply</u></p> <p>The proposed development shows access onto Great South Road via two vehicle crossings. The existing accesses onto Market Road (via Market Square) and Church Street (unformed) will be removed.</p> <p>f) Not applicable</p> <p>g) Complies</p> |

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| <p>P2 On-site parking and loading</p> <p>14.12.1.2</p> <p>1. All activities must comply with the following on-site parking and loading conditions:</p> <p>a) The parking requirements in Table 14.12.5.7 and 14.12.5.11, noting:</p> <p>i. When calculating the requirements for parking and loading on the basis of the prescribed floor area, the area for parking, loading and manoeuvring shall be excluded;</p> <p>ii. If the calculation results in a fraction, then that figure shall be rounded to the nearest whole number;</p> <p>iii. 90 percentile car dimensions in Figure 14.12.5.8 apply;</p> <p>iv. The requirements of Table 14.12.5.7 do not apply to residential and rural activities;</p> <p>v. Parking spaces must comply with the New Zealand Building Code D1/AS1 New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001)</p> <p>vi. The number of accessible car park spaces required in Table 14.12.5.9 can be included in the number of car parking spaces required in Table 14.12.5.7.</p> <p>b) On-site bicycle space requirements in Table 14.12.5.10, except:</p> <p>i. The requirements of Table 14.12.5.10 do not apply to residential and rural activities;</p> <p>c) Any on-site car parking spaces for non-residential activities within the Residential Zones must be set back at least 3m from the road boundary of the site and screened by planting or fencing;</p> <p>d) On-site car parking spaces and loading bays are to be provided in accordance with the requirements of Table 14.12.5.7, Figure 14.12.5.8 and Table 14.12.5.11 and be located on the same site as the activity for which they are required;</p> <p>e) On-site car parking spaces and loading bays are formed;</p> <p>f) On-site car parking spaces and loading bays are to be permanently marked if five or more parking spaces are required;</p> <p>g) On-site car parking spaces and loading bays are not to be located on any shared access or residential court;</p> <p>h) Vehicles occupying any on-site car parking or loading spaces must have ready access to the road (or relevant access or right of way) at all times, without needing to move any other vehicle occupying other on-site car parking or loading spaces;</p> <p>i) On-site car parking spaces and loading bays are not required on sites with sole frontages to the following:</p> <p>i. Main Street, Huntly;</p> <p>ii. Jesmond Street, Ngaruawahia;</p> <p>iii. Bow Street, Raglan (James Street to Cliff Street);</p> <p>iv. George Street, Tuakau (Gibson Road to Liverpool Street);</p> <p>v. Great South Road, Pokeno (Selby Street to Market Street);</p> <p>vi. Main Street, Te Kauwhata (Saleyard Road to Baird Avenue).</p> | <p>a) Complies</p> <p>In accordance with 14.12.5.7 the parking requirement for service stations is;</p> <p>1 car space per 45m² GFA excluding car washes and canopies over petrol pumps,</p> <p>plus 3 queuing per car wash,</p> <p>plus 4 per repair bay.</p> <p>No loading bay is required.</p> <p>b) Complies</p> <p>No bicycle parking spaces required.</p> <p>c) Not applicable</p> <p>d) <u>Does not comply</u></p> <p>Parking space obstructed by kerb (at rear of site needs to be extended to 6.0m length).</p> <p>e-i) Not applicable</p> |

| Rule | Assessment of Proposal |
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| <p>P3 On-site manoeuvring and queuing</p> <p>14.12.1.3</p> <p>1. All activities must comply with the following on-site manoeuvring and queuing conditions:</p> <p>a) On-site manoeuvring space shall be provided to ensure that no vehicle is required to reverse onto a road except:</p> <p>i. Rule 14.12.1.3(1)(a) does not apply to Local Roads within the Residential and Village Zones with a posted speed limit of less than 60 kph;</p> <p>b) A 90 percentile car, as defined in Figure 14.12.5.8, can enter and exit all parking spaces without making more than one reverse movement, excluding spaces required for a dwelling;</p> <p>c) On-site manoeuvring space for any heavy vehicle shall comply with the tracking curve (relevant for the type of activities to be carried out on the site and trucks to be used), as set out in the guideline RTS 18 - New Zealand on-road tracking curves for heavy motor vehicles (2007);</p> <p>d) On-site manoeuvring space shall be formed;</p> <p>e) On-site queuing space shall be provided in accordance with Table 14.12.5.12 for vehicles entering and exiting any on-site car parking, loading or manoeuvring space, where:</p> <p>i. Length is measured from the road boundary where vehicles first enter the site; and</p> <p>ii. On-site queuing above must not encroach into the required on-site manoeuvring area;</p> <p>f) On-site manoeuvring and queuing spaces are not required on sites with vehicle accesses/entrances to the following:</p> <p>i. Main Street, Huntly;</p> <p>ii. Jesmond Street, Ngāruawāhia;</p> <p>iii. Bow Street, Raglan (James Street to Cliff Street);</p> <p>iv. George Street, Tuakau (Gibson Road to Liverpool Street);</p> <p>v. Great South Road, Pokeno (Selby Street to Market Street);</p> <p>vi. Main Street, Te Kauwhata (Saleyard Road to Baird Avenue).</p> | <p>a) Complies</p> <p>b) Complies</p> <p>For access to the parking spaces at the air hose (although no parking spaces are required under the PDP)</p> <p>c) Complies</p> <p>d) Complies</p> <p>e) Complies</p> <p>No queuing space required where less than 3 parking spaces are provided. However, there is limited length for queuing from the vehicle crossings to the fuel pumps.</p> <p>f) Not applicable</p> |
| <p>P4 Traffic Generation</p> <p>14.12.1.4</p> <p>1. Any activity must comply with the following traffic generation conditions:</p> <p>a) N/A</p> <p>b) N/A</p> <p>c) Within the Business Zone Tamahere, Business Zone or Business Town Centre Zone there is a maximum of 300 vehicle movements per day, and no more than 15% of these vehicle movements are heavy vehicle movements; or</p> <p>d) – g) N/A</p> <p>Note: Table 14.12.5.13 provides indicative traffic generation rates for various activities.</p> | <p>a) – b) Not applicable</p> <p>c) <u>Does not comply</u></p> <p>Traffic assessment estimates 60 tph or about 600 trips per day.</p> <p>d) – g) Not applicable</p> |

| Rule | Assessment of Proposal |
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| Business (F) Zone Rules (ODP Franklin Section) | |
| <p>29.5.6 Parking Space</p> <p>1. Subject to 29.5.6: 2 and the provisions of Part 51, parking spaces (and associated manoeuvring/driveway areas) shall be provided on site for all activities as follows:</p> <p>(a) For SITES within the Business Centres shown on the planning maps: One space for every 40 square metres of gross floor area located at ground level. (i) (ii) One space for every 50 square metres of gross floor area above ground level.</p> <p>(b) For SITES outside the Business Centres shown on the planning maps: (i) One space for every 30 square metres of gross floor area.</p> <p>2. (Construction) For SITES within the Business Centres shown on the planning maps: All parking and manoeuvring areas shall be formed, drained and maintained to a tar- or chip-sealed or concreted surface in accordance with accepted practice for 'commercial' loadings, and such that stormwater will in all weathers leave the site in a controlled manner so as to have no potential to cause damage to roads or adjoining properties.</p> <p>3. (Construction) For SITES outside the Business Centres shown on the planning maps: Subject to Rule 29.5.8: 2, all parking and manoeuvring areas shall be formed, drained and maintained to at least a compacted metal (rock chip) surface, in accordance with accepted practice for 'commercial' loadings, and such that: 3. Stormwater will in all circumstances leave the site in a controlled manner so as to have no potential to cause damage to roads, service lanes, or adjoining properties; and • metal will not be washed or carried onto any road, service lane or adjoining property.</p> | <p>Complies with 2 parking spaces, parking and manoeuvring space is to be concrete</p> <p>Table 51.A requires: 1 per 30m² of retail space plus 4 per workshop bay plus 3 Queuing spaces for a car wash plus 2 per air hose/vacuum</p> <p>Table 51.B, Note 1: Parallel parking spaces (Parking angle = 0) shall be 6.0m long except where the end of the space is not obstructed, in which case the length of a space may be reduced to 5.0m.</p> |

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| <p>29.5.7 Loading Spaces</p> <p>1. (Number of spaces) Subject to the requirements of Rule 51 all activities shall, on the same site as that activity, have the number of loading spaces as determined in accordance with the following requirements:</p> <p>(i) For SITES within the Business Centres shown on the planning maps: One space per site</p> <p>(ii) For SITES outside the Business Centres shown on the planning maps: One space per site, but not less than two spaces for any site having a total building gross floor area of over 1000 square metres.</p> <p>2. (Design) All loading spaces and associated manoeuvring areas shall comply with the following design requirements:</p> <p>(i) No loading space can be sited in such a way that service vehicles have no option but to reverse onto or off the site. The Council may waive this requirement where a site is small or service access is to a service lane, no-exit road or to a street which carries low traffic volumes.</p> <p>(ii) All loading spaces or areas shall not be less than 8 metres in depth, 4 metres in width, and 4.25 metres in height.</p> <p>(iii) All loading spaces or areas shall be provided with an access path that complies with Diagram 51.F.</p> <p>3. (Construction) All loading and associated manoeuvring areas shall, depending on the location of the site, comply with Rule 29.5.6: 3 or Rule 29.5.6: 4 as if the reference to 'parking' was to 'loading' spaces.</p> | <p>1. (i) <u>Does not comply</u> <u>Not applicable</u> as no loading space required due to no shop/convenience store on site. Fuel delivery by tanker to remote fill points at rear of site.</p> <p>2. Complies</p> <p>3. Complies</p> |

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| <p>29.5.8 Vehicle Crossings and Driveways</p> <p>Except where access is proposed to a state highway:</p> <p>1. For sites within the Business Centres shown on the planning maps. Vehicle crossings (driveways) between sites and the edge of the formation (kerb line) of any road or service lane shall comply with Council's current policy. Council's policy dated 2007 for vehicle crossings applies and the main requirements are summarized as follows:</p> <ul style="list-style-type: none"> • One crossing per property (contained in one Certificate of Title) • Any property having a frontage in excess of 15 metres but less than 60 metres shall be permitted a second crossing. Any property with a frontage exceeding 60 metres in length shall be permitted one further crossing (i.e. a maximum of three crossings for sites in excess of 60 metres.) • The maximum width of any crossing shall be 6 metres at the boundary line with provision for a splay, provided that the length of crossing on the kerb line shall not exceed seven metres. The total width of such crossings shall not exceed 50% of the frontage of front sites. Where two properties combine to form one crossing, the total width at the boundary line shall not exceed six metres. • A minimum distance of two metres shall be provided between two crossings to act as pedestrian refuge. • Construction standards are set out in the 2007 policy. <p>1A. For sites outside the Business Centres shown on the planning maps, Rule 42A.6.12 applies to vehicle crossings.</p> <p>2. (Driveway apron) Notwithstanding any other rule in this plan, the driveway surface on the site which is adjacent to or behind every vehicle crossing shall be tar- or chip-sealed or concreted to a commercial standard for a distance of 6 metres back from the front boundary of the site, for the full width of the crossing, except that for activities that involve the daily movement of large trucks or truck-and-trailer units, this surface shall be extended into the site for a distance of 12 metres. Where a new or altered vehicle crossing is proposed to the State Highway, the approval of the New Zealand Transport Agency is required.</p> | <p>1. <u>Does not comply</u></p> <p>Crossing A is 6.0m wide at boundary and <u>7.8m</u> wide at kerb (<u>6.5m</u> at boundary and <u>9.4m</u> at kerb including widening for tanker).</p> <p>Crossing B is <u>7.0m</u> wide at boundary and <u>8.8m</u> wide at kerb.</p> |
| <p>29.5.16 Location of Fuel Dispensers</p> <p>Where any activity involves the dispensing of vehicle fuels by retail, the dispensing units or points must be at least 12 metres from the midpoint, on the boundary, of any vehicle crossing provided that for truck stops this distance must be at least 18 metres.</p> | <p><u>Does not comply</u></p> <p>Distance to crossing A is 12.230m</p> <p>Distance to crossing B is <u>10.635m</u></p> |





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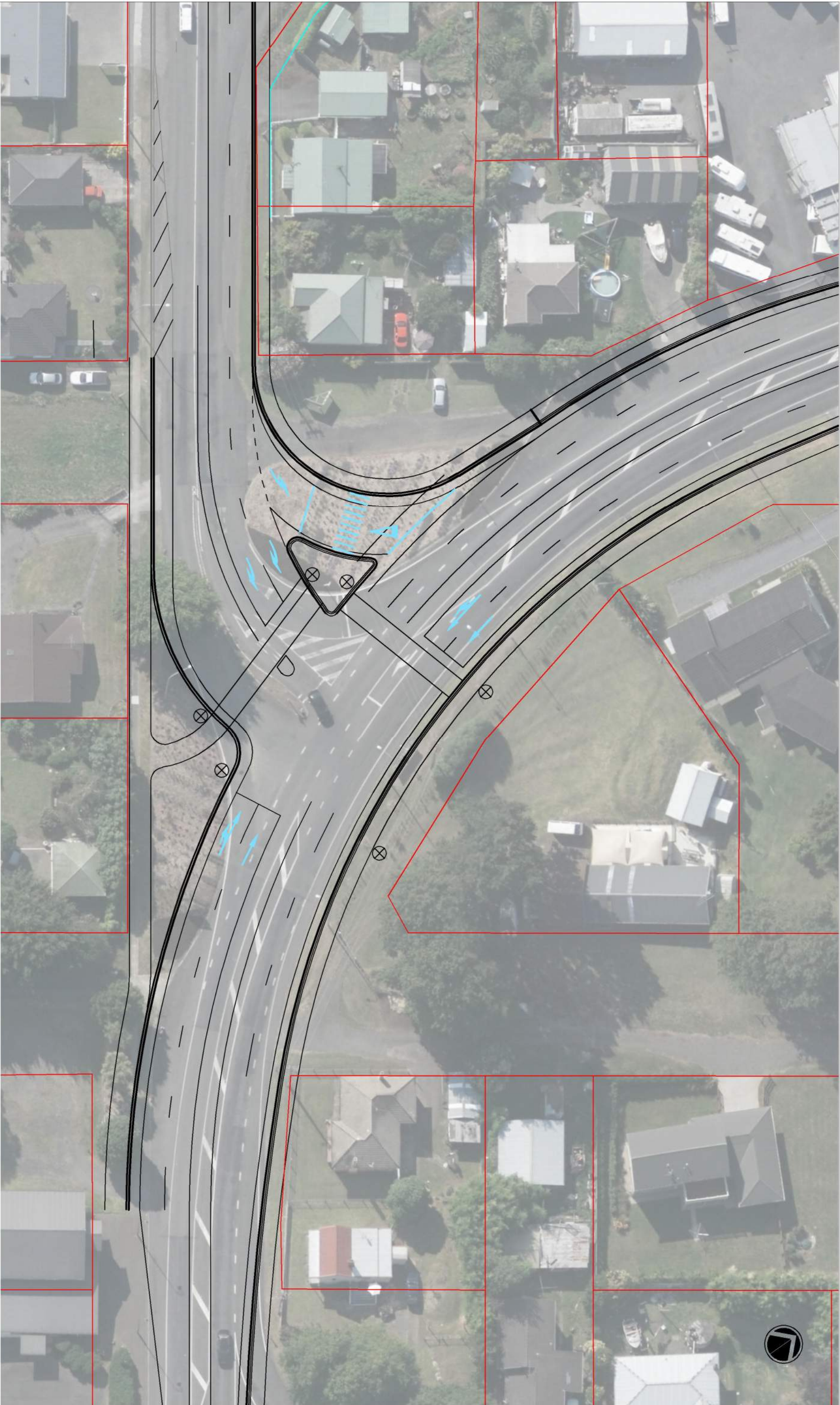
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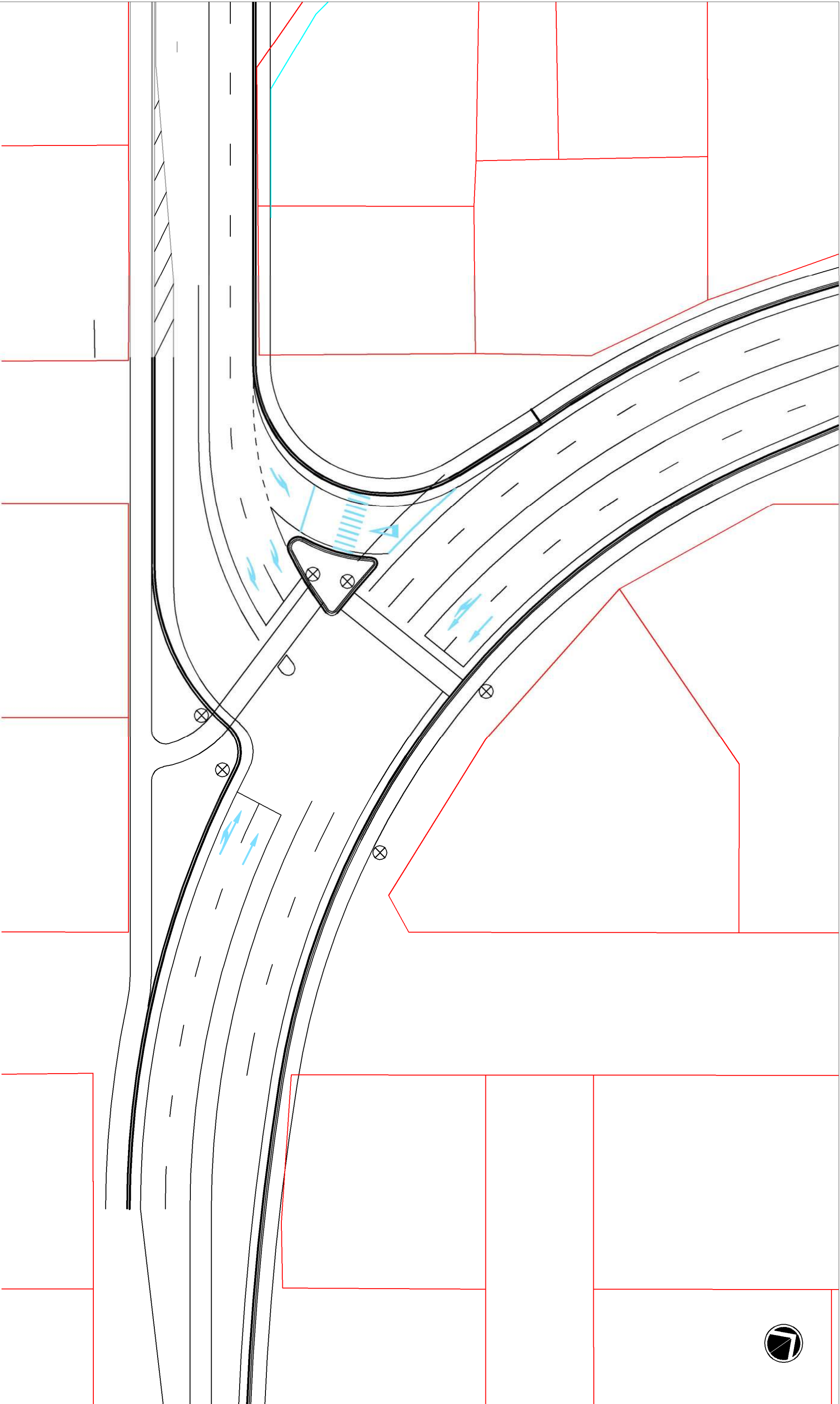
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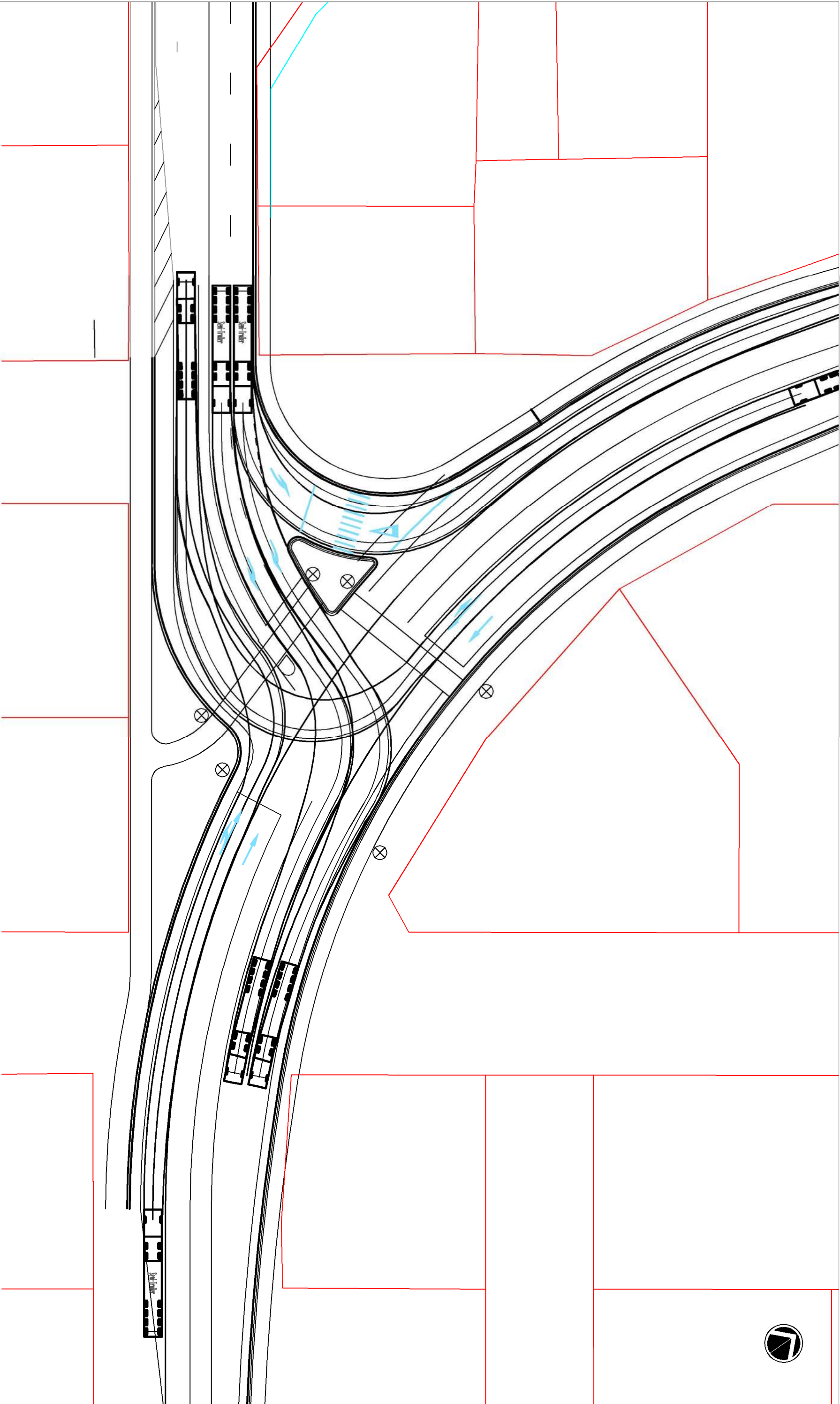
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Hamilton 3240

CIVIL

SCALES
1:250 (A1), 1:500 (A3)
ORIGINAL SIZE
A1

| DRAWN | DESIGNED | APPROVED |
|------------------|-----------------|---------------|
| | | |
| DRAWING VERIFIED | DESIGN VERIFIED | APPROVED DATE |
| | | |

DRAFT DESIGN

PROJECT
WAIKATO DISTRICT COUNCIL
POKENO TOWNSHIP
GREAT SOUTH RD IMPROVEMENTS
TITLE
INTERSECTION SCHEMATIC
WSP PROJECT NO. (SIB PROJECT)
2-WLASS.AV

SHEET NO.
2

REVISION