

Totara Street





Preliminary design stage safety audit



Report prepared for
Tauranga City Council
May 2020



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Cover photo: Automatic gates have already been installed, but are not operational yet



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1. Introduction

1.1. Brief

ViaStrada staff have been commissioned by Tauranga City Council to undertake a NZ Transport Agency (NZTA) compliant road safety audit of Totara Street. The plans are labelled “preliminary design” and the audit area extends from Hewletts Road to Kawaka Street (see Figure 1).



Figure 1: Extent of Totara Street audit

1.2. The safety audit team

The preliminary design stage road safety audit was carried out in accordance with the “NZTA Road Safety Audit Procedure for Projects Guidelines – Interim release May 2013”, by the Safety Audit Team (SAT) consisting of:

- A [REDACTED] the safety audit team leader of ViaStrada Ltd
- [REDACTED] a safety audit team member of ViaStrada Ltd

1.3. Site visits

The daytime site visit was undertaken by the audit team leader on 20 March 2020, but only the concept plans were available at this time. The ViaStrada SAT had audited the project at the previous stage of scheme design; the auditor thus had good familiarity with the site location and the project details.

1.4. Road environment

Totara Street is located within the industrial / commercial area adjacent to the Port of Tauranga and cater for the full range of road users including pedestrians and cyclists. The posted speed limit is 60 km/h.

Totara Street has a very high proportion of heavy vehicles (25%) and during the site visit, a considerable number of high-productivity motor vehicles (HPMV) were also observed. HPMV are the largest permissible vehicle on New Zealand roads and operate between Auckland, Tauranga and Hamilton, refer to section 1.5.

1.5. Design vehicles

For intersections, Austroads GRD4 (2009) describes a design vehicle as “the largest vehicle which can perform any particular turning movement from the appropriate approach lane to the appropriate departure lane with adequate clearances to features such as kerbs and roadside furniture”.

Based on observations of HPMV during the site visit, the SAT has assumed this should be the maximum design vehicle for this project. Descriptions for the HPMV and other design vehicles are as follows:

- Maximum size HPMV is a truck and full trailer with a total length of 23 m and a maximum weight of 62,000kg.
- Standard maximum size semi-trailer is 19 m with a maximum weight of 44,000kg.

For additional HPMV specifications, refer to the NZTA website.¹

1.6. Project information

The audit team previously audited this project in September 2017. The 2020 plans are significantly different. All plans were plotted on 31 March 2020. Two options (where the project extents differ, plus with different crossing details at Hull Road) are under consideration, and the following files were provided:

¹ <http://www.nzta.govt.nz/assets/resources/factsheets/13g/docs/13g-hpmv.pdf>

File name	Sheet names	# of sheets	Revision	Content
2-9B383.05_COVER SHEET_compressed	n/a	1	n/a	Cover sheet
2-9B383.05_GENERAL LAYOUT - OPTION 1_compressed	C01–C08	8	A	Option 1
2-9B383.05_GENERAL LAYOUT - OPTION 2_compressed	C07, C09, C10	3	A	Option 2
2-9B383.05_STANDARD DETAILS_compressed	C30, C31	2	A	Standard details
2-9B383.05_VEHICLE TRACKING AND DEPATRUES_compressed	C90–C93	4	#	Vehicle tracking

1.7. Items not covered

This scheme design safety audit does not cover the aspects of:

- Traffic signals (no details provided)
- Street lighting (no details provided)
- Railway crossings (already built, but not operational during the site visit)

The only signalised intersection included within the project area (i.e. where users cross from one side of the intersection to the other within the site of works) is at Waimarie Street. Traffic does not filter turn across the arm where cyclists are to cross the intersection, so there should not be any safety issues. It is thus inconsequential that the design details are not included in the audit set.

1.8. Audit procedure

The audit follows the NZ Transport Agency Road Safety Audit procedures for projects. The expected crash frequency is qualitatively assessed based on expected exposure (how many road users will be exposed to a safety issue) and the likelihood of a crash resulting from the presence of the issue. The severity of a crash outcome is qualitatively assessed based on factors such as expected speeds, type of collision, and type of vehicle/object involved. The audited facility caters for pedestrians and cyclists who are “vulnerable road users” with a higher likelihood of death or serious injury if involved in a conflict with a motor vehicle.

The frequency and severity ratings are used together to develop a combined qualitative risk ranking for each safety issue using the NZTA Concern Assessment Rating Matrix in Table 1.1 below. The qualitative assessment requires professional judgement and experience from a wide range of projects of varying sizes and locations.

Table 1.1 Severity rating matrix

Likelihood of death or serious injury	Frequency (probability of a crash)			
	Frequent	Common	Occasional	Infrequent
Very likely	Serious	Serious	Significant	Moderate
Likely	Serious	Significant	Moderate	Moderate
Unlikely	Significant	Moderate	Minor	Minor
Very unlikely	Moderate	Minor	Minor	Minor

The ranking of the frequency of crashes has been assessed in accordance with Table 1.2.

Table 1.2: Indicative crash frequency

Crash Frequency	Indicative description
Frequent	Multiple crashes (more than 1 per year)
Common	1 every 1 - 5 years
Occasional	1 every 5 - 10 years
Infrequent	Less than 1 every 10 years

While all safety concerns should be considered for action, the client will make the decision as to what action will be adopted. This report gives safety ranking guidance and it is acknowledged the client must consider factors other than safety alone. The suggested action for each concern category is given in Table 1.3 below.

Table 1.3: Concern categories

Risk	Suggested Action
Serious	A major safety concern that must be addressed and requires changes to avoid serious safety consequences.
Significant	Significant concern that should be addressed and requires changes to avoid serious safety consequences.
Moderate	Moderate concern that should be addressed to improve safety
Minor	Minor concern that should be addressed where practical to improve safety.

It should be noted that the severity rating assigned to the likelihood assigned to 'Death or Serious Injury' is often "Likely" or "Very likely" because crashes between pedestrians and motorised vehicles often results in serious injury or fatality crashes.



We invite our clients to suggest changes for our consideration as part of a client review process. Our preference for this is to use the track changes function of the editing software. We do not consent to any changes, however small they may appear, to be made to any of our writings in the main audit section of our report. This restriction includes our SAT responses.

We do not consent to any changes... to be made to the main audit section of our report.

1.9. Disclaimer

The findings and recommendations in this report are based on the site visit undertaken by the safety auditor, an examination of available relevant plans, the specified road and environs, and the SAT's professional knowledge and experience. However, it must be recognised that no audit can guarantee the elimination of all possible safety concerns as all traffic environments consist of a multitude of elements that are never completely within the control of engineering design.

Safety audits, by nature, focus on aspects relating to safety and therefore do not constitute a complete review of design or assessment of standards with respect to engineering or planning documents. Similarly, the safety audit focuses on the plans provided; it is not the role of the SAT to identify all elements such as signage, markings, pedestrian tactile pavers, or traffic signal hardware in the absence of more detailed plans.

This audit applies to the stated project. Whilst some issues covered are general and might be applicable to other locations, the SAT does not take any responsibility for transferral of concepts to other projects or locations.

While every effort has been made to ensure the accuracy of the report, it is made available on the basis that anyone relying on it does so at their own risk without any liability to the safety audit team or their organisations.



2. Safety audit findings

2.1. General issues

2.1.1. Flush dual crossings

Probability of crash occurring – **Occasional**

Likelihood of serious / fatal injury – **Very likely**

Ranking – **Significant**

The plans give the impression that the proposed dual crossings (i.e. zebra plus cycle) are not installed on raised platforms, but instead painted onto the existing carriageway. This is not considered best practice as it will be difficult to achieve the desired speed environment for this form of crossing to be safe. NZTA’s cycling network guidance currently states regarding dual crossings “Speeds should be below 30km/h and ideally below 20km/h. Vertical elements are the most effective in reducing speeds and **it is recommended that a raised platform should be used at the crossing point** with steep ramps to achieve the target vehicle speed.”² (emphasis added). We note that this guidance was only published in January 2020, but add that prior to this, the CNG information on the “operational trial” (i.e. exempt from the formal TCD trial requirements and open for implementation at other locations) of dual crossings (then termed “paired cycle priority / zebra crossings”) clearly stated that a platform was included.

We recall a safety audit of a different project where we recommended that raised crossings be installed. The RCA went ahead and installed flush crossings. Following a serious crash (where a driver failed to give way), speed humps were retrofitted on either side of the crossing. That was on a road carrying about 7,000 veh/day with a low heavy vehicle proportion.

Totara Street is an environment where dual crossings are even more needed to help path users cross the road safely. The problem is that drivers failing to give way may run over users of the crossing. This may happen occasionally, and given the high proportion of heavy vehicles, the outcomes are likely or very likely to result in death or serious injury. Therefore, the overall safety rating is significant.

Recommendations:

2.1.1.1. Place dual crossings on raised platforms.

Designer Response: *The road crossings on both Triton Ave and Hull Road are on commercial/industrial roads carrying significant numbers of heavy vehicles to the Port of Tauranga. The speed environment at the approach to both crossings is low and already 30 km/h where*

² <https://nzta.govt.nz/walking-cycling-and-public-transport/cycling/cycling-standards-and-guidance/cycling-network-guidance/designing-a-cycle-facility/crossings/unsignalised-crossings/>



	<p><i>vehicles are approaching or leaving a Tee intersection on Triton and a roundabout on Hull. The designer has not recommended raised tables on these heavy haul roads as raised tables will have a detrimental operational performance on heavy and overweight vehicles as well as high installation and ongoing maintenance costs. The designer has used raised and embossed markings to make the crossings more visible to approaching drivers in favour of raised tables. The embossed 3m wide green cycle crossing marking and the 600mm by 3m thermoplastic pedestrian bars provide a significant visible presence to approaching drivers in all weather conditions.</i></p>
<p>SAT Response:</p>	<p><i>The SAT retains its opinion that raised platforms should be used at the identified crossings. We are unconvinced that the speed environment is as low as outlined, especially during off-peak hours.</i></p> <p><i>Further to our comments above, the SAT would like to add that an advantage of a raised crossing is that the vertical element provides a reminder to a crossing driver of its presence. That provides a significant safety benefit. Despite the anticipated prominence of the embossed markings, cycle crossings of this nature are a new device, and a raised platform is more likely to emphasise the requirement that drivers are to give way to people cycling.</i></p>
<p>Safety Engineer:</p>	<p><i>Agree that a raised table is the preferred (safest) option for this type of crossing. However, this does not mean that an at-grade crossing is inherently unsafe. While pedestrians and cyclists have priority at these crossings there is still a requirement to check that traffic has stopped/is stopping, and to only proceed when safe. An at-grade crossing would be a gentle reminder to pedestrians that they are crossing a road, and of the related hazards, and might encourage more users (cyclists in particular) to slow/stop prior to crossing.</i></p> <p><i>Recommend that design options for a raised platform that is appropriate for the heavy traffic users is considered further but not considered essential to an acceptable design being achieved.</i></p>
<p>Client Decision:</p>	<p><i>Agreed that a raised table should be installed. The standards to be applied are outlined in Auckland Transport Design Manual Section 2 - Code of Practice: Local Area Traffic Management Swedish Type TC014A. The approach ramp to be designed at 1:10 over 1m for cars and trucks.</i></p>

	<i>Speed table (Swedish Ty</i>
<i>Action Taken:</i>	<i>Speed tables to be installed</i>

2.1.2. Dual crossing layout

Probability of crash occurring – **Occasional**

Likelihood of serious / fatal injury – **Very likely**

Ranking – **Significant**

Truck drivers have very limited visibility to their left, and immediately in front of their vehicle. The graphic in Figure 2 gives an indication of this.

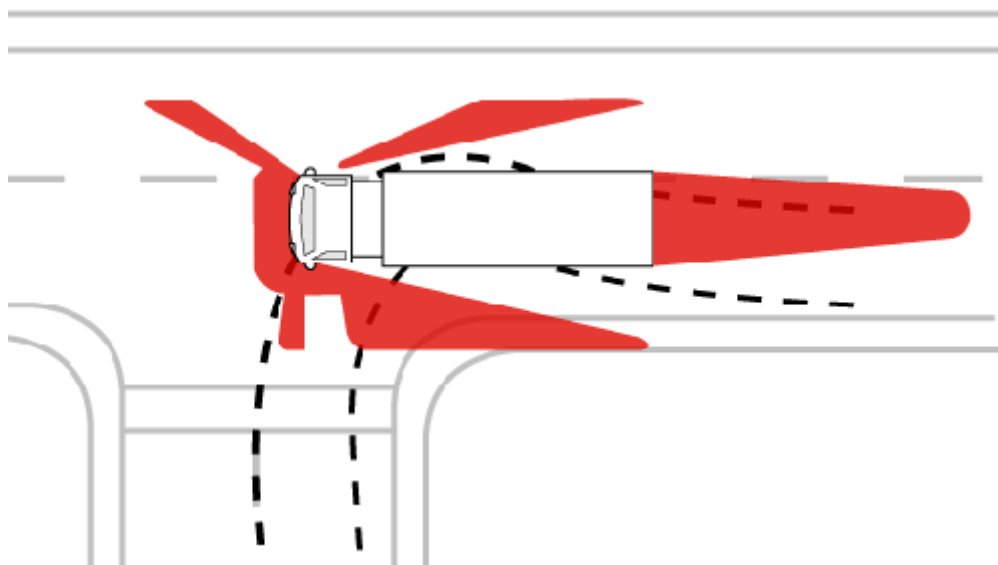


Figure 2: blind spots for truck drivers in red³

The area coned off in Figure 3 (including the bicycle) cannot be seen by the driver of the logging truck; neither can the yellow airport fire engine be seen by the driver.

³ The graphic is in use by both the Transport Agency and Cycling Action Network, who have been working with both trucking and cycling interests on increasing awareness of the issues.



Figure 3: truck driver blind spot area is coned off

Truck driver visibility will cause a problem at the three proposed dual crossings. If a truck stops at a crossing to wait for path users crossing in either direction, a cyclist approaching from behind the truck and then crossing in front of that truck will be in the truck driver’s blind spot for almost the entire time. If the truck driver was not initially aware of that cyclist, or if another approaches from behind at some distance, a truck driver may start up as a cyclist is about to cross; it is conceivable that the driver will never have seen the second cyclist, and that the cyclist is unaware of not having been seen.

For this reason, path approaches to dual crossings should ideally be perpendicular to the road to be crossed (but offset from the carriageway enough so that path users are not in the side of the driver blindspot). This is not the case with either of the crossings.

One way to possibly mitigate for this risk is to set back the limit line from that approach to the dual crossing where cyclists approach the crossing from behind a truck driver. For example, instead of the standard 5 m setback, consider doubling that distance.

Recommendations:

2.1.2.1. Mitigate the risk to cyclists who are approaching the dual crossings from behind trucks already stopped at the limit line being overlooked / in the driver’s blind spot.

Designer Response: *Agree with the SAT. The limit lines to the crossings at Hull Road shall be set back 10m as suggested. This cannot be achieved at Triton Ave as the crossing is too close to Totara St. Shifting the crossing further away from Totara St at Triton Ave will require land from the power Sub-Station site to provide the berm space on which to locate the shared path extension. There is also a wide industrial crossing on the opposite side of the road which will place the crossing further away and beyond the desire line of pedestrians and cyclists. This distance will encourage misuse and*



	<i>jay walking. The desirable solution is to signalise the Totara St/Triton Ave intersection. The alternative may be to remove the pedestrian crossing and cycle markings and allow both pedestrians and cyclists to make the appropriate judgement when to cross safely.</i>
SAT Response:	no further comment
Safety Engineer:	<i>Agree with Designer response.</i>
Client Decision:	<i>Agree with designers response, and designer to consider opportunities to include audio tactile profiled roadmarkings for the limit lines</i>
Action Taken:	<i>Action to be included in design</i>

2.1.3. Dual crossing traffic control devices

Ranking – Comment	
<p>Dual crossings require a give way sign facing approaching traffic with a supplementary plate “to pedestrians and cyclists”. These TCDs create the precedence, but they are missing from the designs. Note the link in the previous section to the recently published design guidance.</p> <p>In several cases, diamonds are proposed to be marked near dual crossings. Please note that diamond markings are for pedestrians, not drivers (school children get taught not to step onto a zebra crossing if there is a vehicle approaching that is closer than the diamond). Diamonds should thus not be marked where the minimum setback requirements cannot be met.</p> <p>At some of the dual crossings, diamonds are shown on the designs near the limit lines, i.e. where give way triangles should be marked instead. Give way triangles are mandatory markings and must be provided.</p>	
Recommendations:	
2.1.3.1.	Add the missing traffic control devices to the proposed dual crossings.
2.1.3.2.	Leave off the diamond markings that do not have the required setback.
2.1.3.3.	Provide give way triangle markings where these are mandatory.
Designer Response:	<i>The design was incomplete at this scheme stage with respect to signs and markings. Agree with the SAT for all three items being 2.1.3.1, 2.1.3.2 & 2.1.3.3</i>
SAT Response:	no further comment

Safety Engineer:	<i>Agree with the Designer response and note that with potential changes to markings under the Accessible Streets proposals, the markings should be consistent with any changes which result from these proposals.</i>
Client Decision:	<i>Agree</i>
Action Taken:	<i>Designer to ensure appropriate and accurate markings and signage is in place</i>

2.1.4. Access to bus stops

Ranking – Comment

Totara Street is now serviced by a bus route (see Figure 6). It is unclear whether the provision of pedestrian islands should be part of the scope of this project. Given the traffic volume on the road, pedestrian islands would certainly make it easier (and probably safer) to get to and from the bus stops from the other side of the road.



Figure 4: bus stopped at bus stop outside 198 Totara Street

Recommendations:

2.1.4.1. Consider pedestrian refuge islands to give better access to bus stops.

Designer Response: *The proposed shared path is off road with no changes required to exiting carriageway markings. The provision for bus stops and crossing points to service those bus stops was beyond the scope of this project but can be included if TCC require.*

SAT Response: no further comment

Safety Engineer:	<i>The Designer should maintain contact with bus operators to ensure that the project design remains compatible with any proposed public transport infrastructure plans.</i>
Client Decision:	<i>A decision around the future bus route on Totara Street are anticipated in August through the development of the Transport System Plan. This could result in buses being directed onto Maunganui Road only rather than Totara Street. Once a decision is made, any work associated with the bus stops could be retrofitted.</i>
Action Taken:	<i>Await decision from TSP in relation to bus route on Totara Street.</i>

2.1.5. Unusual mid-block path markings

Ranking – Comment

The cycle and pedestrian symbols used in path markings should be aligned for view of the path users. Driveway markings, on the other hand, are aligned for view of drivers on the driveway. Figure 5 shows an example of where path markings have been used with incorrect orientation for path users.

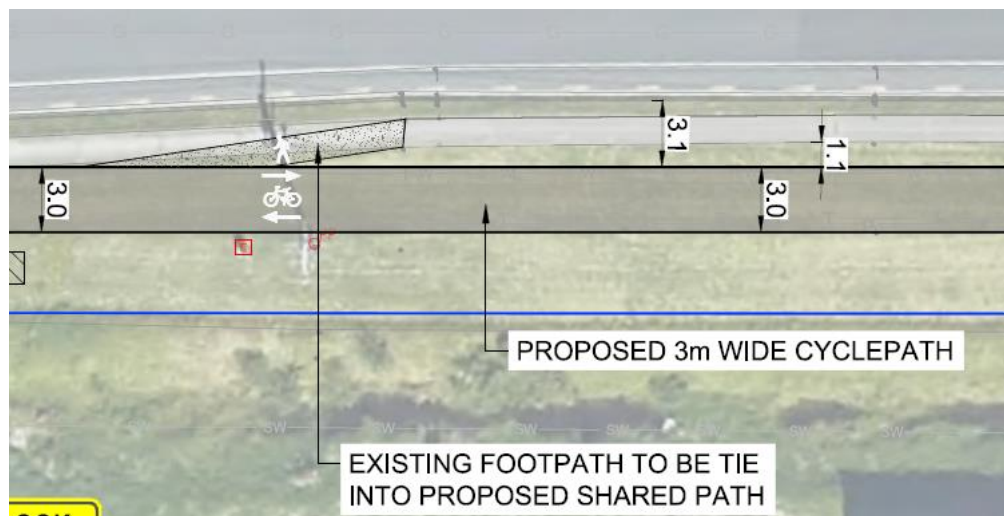


Figure 5: Incorrect alignment of path markings

Recommendations:

2.1.5.1. Realign path markings.

Designer Response: Agree

SAT Response: no further comment

Safety Engineer: Agree with Designer response.

Client Decision:	<i>Designer to ensure that all road markings are appropriate as outlined by SAT</i>
Action Taken:	<i>Incorporated into design</i>

2.2. Specific issues

2.2.1. Driveway at 207 Totara Street

Ranking – Comment

The SAT does not know the operational practice at 207 Totara Street (see Figure 6). There is a gate installed some 20 m beyond the edge of the proposed pathway. An HPMV is 23 m long. If these types of vehicle were to stop at a closed gate, a pathway would be completely blocked.

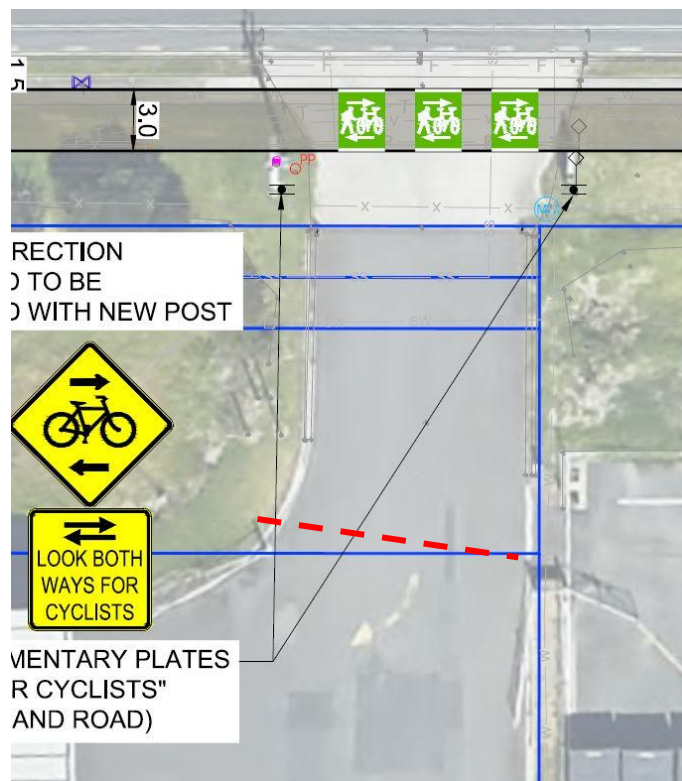


Figure 6: gate indicated in red dashed line



Recommendations:	
2.2.1.1.	Ensure that there are no operational procedures in place that require entering HPMVs to stop at a closed gate.
2.2.1.2.	Alternatively, shift the gate further into the site.
Designer Response:	<i>Agree with the SAT. TCC will require consultation with the owner/operator to ensure the gates remain open during business hours for use by large heavy vehicles to avoid stopping and encroaching over the shared path.</i>
SAT Response:	no further comment
Safety Engineer:	<i>Agree with Designer response and recommend that TCC make use of any available enforcement options to ensure that the site operator is not creating a hazard (i.e. trailer blocking the thoroughfare) due to their gate procedures.</i>
Client Decision:	<i>Agree, the team to get formal agreement from 207 Totara Street around use of gates. This will be incorporated into comms and engagement plan to ensure action is closed out</i>
Action Taken:	<i>Include in comms and engagement plan and action accordingly</i>

2.2.2. Hexion driveway

<p>Probability of crash occurring – Infrequent</p> <p>Likelihood of serious / fatal injury – Likely</p> <p>Ranking – Moderate</p>
<p>The SAT was informed that the procedure of letting a truck onto the Hexion site at 165 Totara Street takes about 10 minutes. The driveway gate scales at some 24 m from the edge of the path (Figure 7), meaning that an HPMV that pulls up close to the gate would not block the path. The problem is, though, that trucks parked for a long time immediately adjacent to the edge of the shared path waiting to access the site will completely block visibility for drivers leaving the site at this driveway. There is no intervisibility between leaving drivers and southbound cyclists.</p>



Figure 7: Hexion driveway layout, with gate indicated in red dashed line

The problem at that a cyclist hit by a vehicle leaving the driveway may be thrown into a live traffic lane or run over by the vehicle leaving the site. This may happen infrequently but can be expected to likely result in serious injury or death.

Recommendations:

2.2.2.1. Consider options available for mitigating the risk of drivers leaving the driveway and southbound cyclists have zero intervisibility when a long truck gets processed at the entry gate.

Designer Response: *Agree with the SAT. Provide additional signage for both cyclists and pedestrians as well as vehicles leaving the site. Signage could also be supported by pavement marking.*

SAT Response: *The SAT is concerned that proposed remedial measures may not be sufficient. In addition to the measures described, physical speed control (e.g. a speed hump) for departing drivers should be used to reinforce the requirement to give way.*

Safety Engineer: *In the circumstances described by the SAT, speed is not an issue as the truck would effectively be emerging from the site with zero sight line onto a busy arterial road (regardless of the presence of a footpath or shared path). Any truck would therefore already be crawling slowly towards the kerb until visibility was achieved.*

	<p>However, the risk of low-speed conflict remains. Recommend further liaison with Hexion to get more detail about the frequency of long vehicle access; whether a flush median type marking could be introduced on their vehicle crossing to encourage physical separation between entering and exiting vehicles; whether Hexion could implement controls so that vehicles are not permitted to exit when a long truck is blocking sight lines.</p>
<p>Client Decision:</p>	<p>Speed judder bars to be installed on either of approaches to the crossing. Agree with Safety Engineers response to also support business by working with them with health and safety procedures to implement controls as suggested</p>
<p>Action Taken:</p>	<p>Designs to include speed judder bars on approaches at both Seeka and Hexion site. Matter around operations at Hexion to be discussed with Hexion with possibility of including the matter in their operational procedures.</p>

2.2.3. Driveway at 157 Totara Street

Ranking – Comment

The driveway at 157 Totara Street on sheet C06 is missing the shared path markings (see Figure 8).

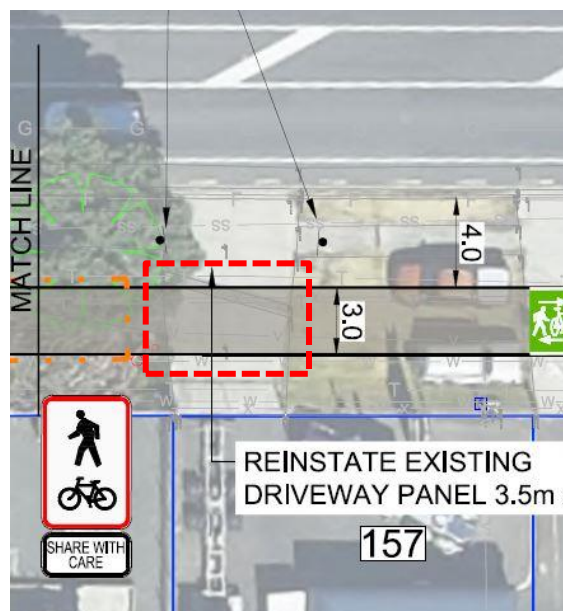


Figure 8: missing pathway markings (highlighted)

Recommendations:	
2.2.3.1.	Add the shared pathway markings.
Designer Response:	<i>Agree markings to be added</i>
SAT Response:	no further comment
Safety Engineer:	<i>Agree with Designer response.</i>
Client Decision:	<i>Agree with Designer response.</i>
Action Taken:	<i>Implemented as part of the design</i>

2.2.4. Narrow path

Ranking – Comment

On sheet C01, the shared path narrows to just 2.0 m over a length of some 40 m (see Figure 9). This happens in an area where it is proposed to mark a 0.5 m wide yellow buffer zone, leaving a useable width of just 1.5 m for the shared path. It needs to be noted that it can be commonly observed that vehicles wanting to reach the kerbside lane mount the pathway with their left wheels. Therefore, having such a narrow path in this location is at best undesirable.

It is acknowledged that there is a large electricity box on the boundary that poses an existing constraint, and it may well be acceptable if the path momentarily narrows at that box. There is also an existing street light pole in this narrow section, but this should be easy to relocate.

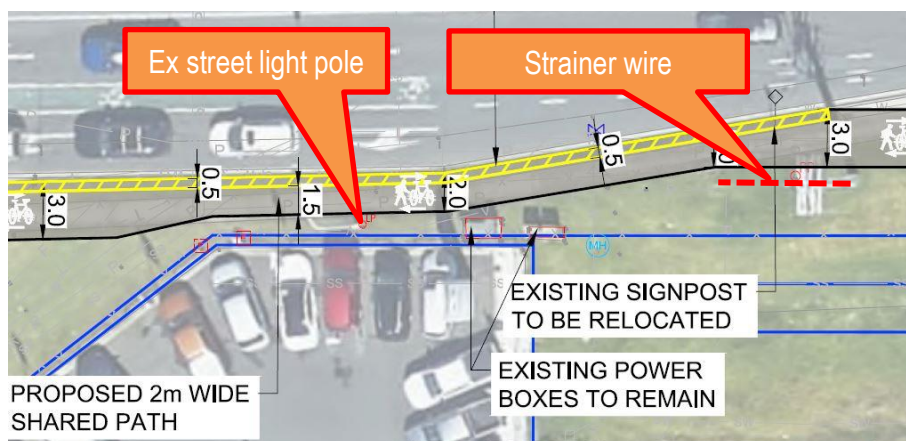


Figure 9: narrow path over 40 m

There is also a strainer wire that may impact on path width if it is too complex or expensive to relocate. If that were to be the case, it may be preferable to have the path in this location behind the power pole and strainer wire. Whilst the path would not be 3.0 m

wide adjacent to the pole, this is preferable over having a narrow path hard against a busy road.



Figure 10: Strainer wire (highlighted)

Recommendations:

2.2.4.1. Reconsider the width and alignment of the path shown in Figure 9.

Designer Response: *Agree with the SAT. The designer presented the option to go behind the pole at preliminary stage. This issue has been further debated with the client post scheme drawings and prior to receiving the SAT recommendations. The funding application has been submitted to include the relocation of the power boxes and stay wire holding the terminal pole to allow a full width path to be installed.*

SAT Response: no further comment

Safety Engineer: *Agree that removing the obstacle(s) would be the preferred solution, subject to funding. However, a pinch-point or short length of narrower path could assist in slowing path users, which would be beneficial in the vicinity of a major intersection.*

Client Decision: *This matter was raised with designer on review of drawings provided to SAT. An alternative of providing a formal signalised crossing across Totara Street is being considered. This will provide a link to the shared path on the Harbour Bridge and avoid potential challenges in crossing the free left turn on Hewletts Road.*

<p>Action Taken:</p>	<p><i>Designer to get prices for undergrounding of poles outside small commercial businesses and relocation of service boxes. Propose that the initial crossing design be incorporated into this design. Modelling results on impacts on network to be shared with NZTA and TTOC to obtain endorsement on this alternative.</i></p>

2.2.5. Waimarie Street approach

Ranking – Comment

The design for the crossing facilities at Waimarie Street is incomplete (see Figure 11). The dual crossing is wider than the current cut down on the splitter island. The crosswalk is much narrower than the shared path approaching it. The limit line for the Waimarie Street approach is within the extension of the shared pathway; the limit line will have to be relocated. With the design not adequately detailed, it is not possible to provide safety audit comments.

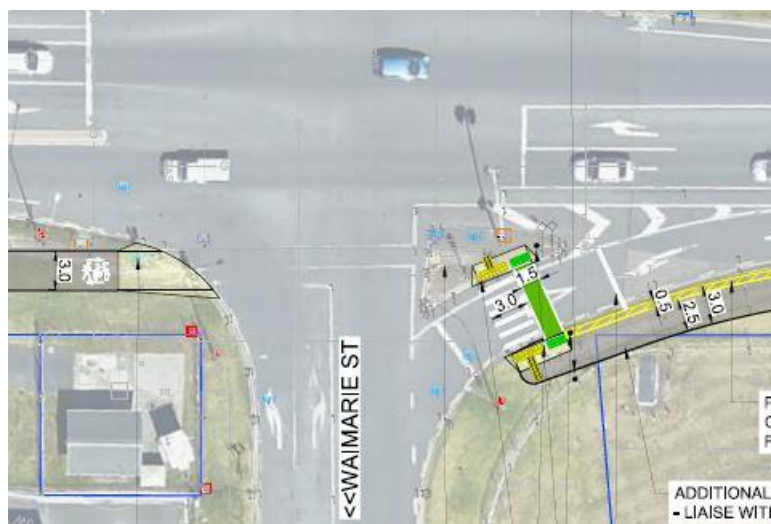


Figure 11: incomplete design at the Waimarie Street approach



Recommendations:	
2.2.5.1.	Provide a design that can be safety audited.
Designer Response:	<i>Agree with SAT. The designer is aware of these issues which will be addressed during the next phase.</i>
SAT Response:	no further comment
Safety Engineer:	<p><i>Agree that the signals layout will need to be modified to suit the width of the shared path.</i></p> <p><i>Also, on the issue of priority on the non-signalised left-turn from Totara into Waimarie, we note the following. The volume of pedestrians and cyclists on the shared path is expected to be relatively low. The volume of vehicles using the left-turn slip is also expected to be very low. However, the majority of vehicles are expected to be heavy vehicles. Given that both parties are expected to have a very high level of service regardless of who has priority, it may be beneficial to maintain the existing vehicle priority arrangement on the slip.</i></p>
Client Decision:	<i>Agree with SAT. Given we experience more than 100 cycles on weekends within an hour, it is recommended that priority be given people biking and walking, and equally raises awareness by truck drivers on the approach.</i>
Action Taken:	<i>Designer to include actions in developing design.</i>

2.2.6. Broken yellow lines

Ranking – Comment
<p>Broken yellow lines have inadvertently been left off sheet 07 as shown in Figure 12. On the approach, broken yellow lines should be included to ensure that there is good intervisibility. On the departure side, broken yellow lines would prevent a squeeze point at the refuge island for people cycling on the carriageway.</p>

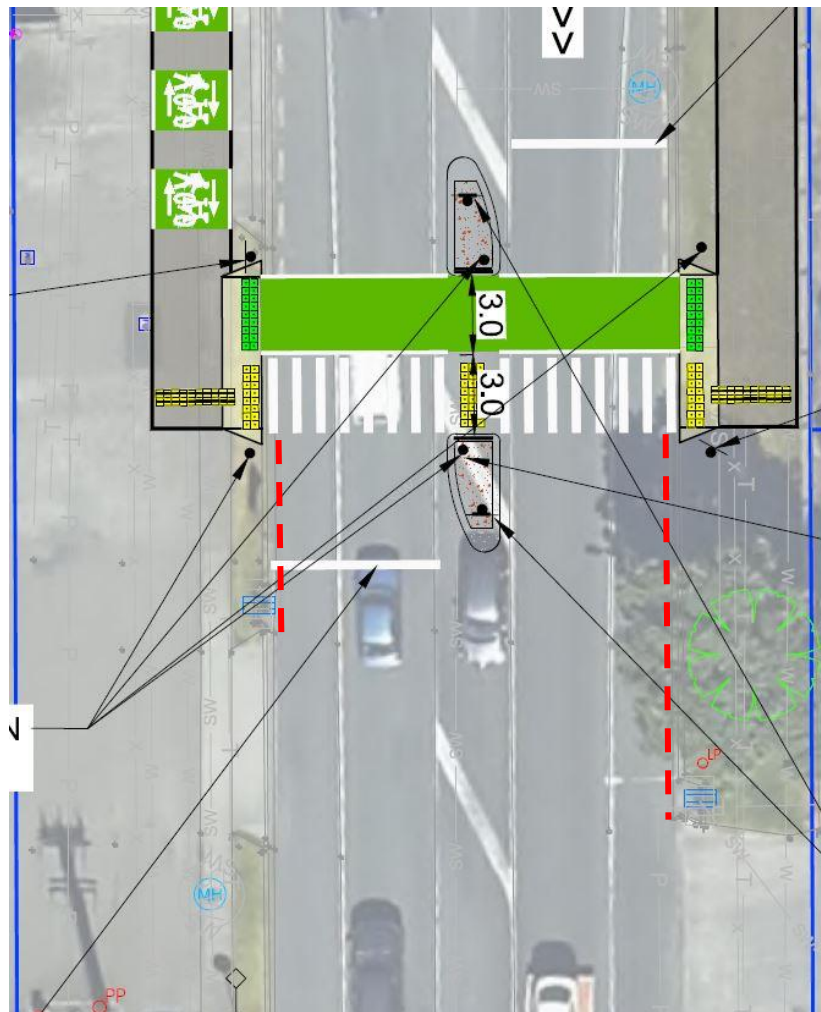


Figure 12: Missing broken yellow lines shown in red

Recommendations:

2.2.6.1. Add broken yellow lines to the design.

Designer Response: Agree

SAT Response: no further comment

Safety Engineer: No comments.

Client Decision: Agree

Action Taken: Include appropriate byls

3. Audit statement

We certify that we have used the available plans, and have examined the specified roads and their environment, to identify features of the project we have been asked to look at



that could be changed, removed or modified in order to improve safety. The safety issues identified have been noted in this report.

Eleven issues were identified and are summarised in Table 3.1 below.

Table 3.1: Summary of Issues

Serious	Significant	Moderate	Minor	Comments	Total
0	2	1	0	8	11