WE ARE CARTERTON.
CARTERTON DISTRICT COUNCIL

26 April 2023

[redacted]

Dear [redacted]

LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT Request: 2023-15

Thank you for your email of 28 March 2023 to the Carterton District Council requesting the following information:

> *"… I … request a copy of the safety audit report commissioned by the West Taratahi Trail Group. I have approached the group directly and they have advised that the report is not designed for external publication. However, that they were working through the report with the council.*
>
> *From my perspective, I don't feel I am able to participate in any consultation without having access to the report, as this is the basis of the consultation.*
>
> *Also, is there an Agenda for the upcoming meeting that will discuss the proposal, with the council and the group.*
>
> *If so, may I also request a copy of the Agenda and supporting documents."*

On 4 April 2023, you clarified your request as:

- *A copy of the West Taratahi Trail Group's commissioned safety audit report.*
- *A copy of the Agenda of the recent meeting between the CDC and the West Taratahi Trail Group, and any relevant supporting documents."*

Your request has been considered under the Local Government Official Information and Meeting Act 1987 (the Act).

The two documents that we have that are within scope of your request are attached as **Appendix A**, and **Appendix B.** Information withheld is under the following section of the Act:

- 7(2)(a), to protect the privacy of the natural person.

Where information has been withheld under section 7(2), I have considered, as required under section 7(1) of the Act, the public interest considerations favouring its release. I have identified no public interest considerations which outweigh the need to withhold information at this time.

Please note, the Council now proactively publishes LGOIMA responses on our website. As such, we may publish this response on our website after five working days. Your name and contact details will be removed.

Thank you again for your email. You have the right to ask an Ombudsman to review this decision. You can do this by writing to info@ombudsman.parliament.nz or Office of the Ombudsman, PO Box 10152, Wellington 6143.

Yours sincerely

Geoff Hamilton
Chief Executive
Carterton District Council

URBAN CONNECTION
local and connected

Appendix A

Norfolk Road Walking and Cycling Trail

Detailed Design Stage Safe System Audit Report

Prepared for Carterton District Council

REVISION 1 - FEBRUARY 2023

Table of Contents

1 Safe System Auditing for Transport Projects

This report has been prepared in response to a request from the Carterton District Council to carry out a Detailed Design Stage Safe System Audit for the Norfolk Road Walking and Cycling Trail project, as proposed by the West Taratahi Trails Group (WTTG).

A Safe System audit is an independent review of a future transport project to identify any safety concerns that may affect the safety performance and alignment to a Safe System. The audit team considers the safety of all road users and qualitatively reports on road safety issues or opportunities for safety improvement.

A Safe System audit is, therefore, a formal examination of a transport project, or any type of project which affects road users (including cyclists, pedestrians, mobility impaired etc.), carried out by an independent competent team which identifies and documents Safe System alignment and road safety concerns.

A Safe System audit is intended to help deliver a safe road system and is not a review of compliance with standards.

1.1 Safe System Audit Procedure

The primary objective of a Safe System audit is to deliver a project that achieves an outcome consistent with the Safe System approach, that is, minimisation of death and serious injury. The Safe System audit is a safety review used to identify all areas of a project that are inconsistent with a safe system and bring those concerns to the attention of the client in order that the client can make a value judgement as to appropriate action(s) based on the risk guidance provided by the safety audit team.

The key objective of a Safe System audit is summarised as follows:

To deliver completed projects that contribute towards a Safe System by identifying and ranking potential safety concerns for all road users and others affected by a transport project.

A Safe System audit should be undertaken at project milestones such as:

- Concept Stage (part of Business Case);
- Scheme or Preliminary Design Stage (part of Pre-Implementation);
- Detailed Design Stage (Pre-implementation / Implementation); and
- Pre-Opening / Post-Construction Stage (Implementation / Post-Implementation).

A Safe System audit is not intended as a technical or financial audit and does not substitute for a design check on standards or guidelines.

Any recommended treatment of an identified safety concern is intended to be indicative only and to focus the design team on the type of improvements that might be appropriate. It is not intended to be prescriptive and other ways of improving road safety or operational problems identified should also be considered.

In accordance with the procedures set down in the "Waka Kotahi NZ Transport Agency Safe System Audit Guidelines," the audit report should be submitted to the client, who is to instruct the design team to respond. The design team should consider the report and comment to the client on each of any concerns identified, including their cost implications where appropriate, and make a recommendation to either accept or reject the audit report recommendation.

For each audit team's recommendation that is accepted, the client shall make the final decision and brief the design team to make the necessary changes and/or additions. As a result of this instruction, the design team shall action the approved amendments. The client may involve a safety engineer to provide commentary to aid the decision.

Decision tracking is an important part of the Safe System audit process. A decision tracking table is embedded into the report format at the end of each set of recommendations to be completed by the design team, safety engineer and client for each issue, documenting the design team's response, client decision and the action taken.

A copy of the report, including the design team's response to the client and the client's decision on each recommendation, shall be given to the Safe System audit team leader as part of the important feedback loop. The Safe System audit team leader is to disseminate this to team members.

1.2 The Safe System

A Safe System is a forgiving road system that takes into account human fallibility and vulnerability. Under a Safe System, the whole transport system is designed to protect people from exposure to high crash forces that lead to death and serious injury (DSI).

It is recognised that people are vulnerable, and the key crash types and associated crash forces that people can be exposed to lead to death or serious injuries. A Safe System manages crash forces within these limits to protect people.

The audit team is required to understand the human tolerance to force and identify where these boundary conditions are likely to be exceeded when reviewing the transport project.

1.3 Report Format

The potential road safety problems identified have been ranked as follows:

The expected crash frequency is qualitatively assessed on the basis of 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 on the basis of factors such as expected speeds, type of collision, and type of vehicle involved.

Reference to historic crash rates or other research for similar elements of projects, or projects as a whole, have been drawn on where appropriate to assist in understanding the likely crash types, frequency and likely severity that may result from a particular concern.

The frequency and severity ratings are used together to develop a combined qualitative risk ranking for each safety issue using the Safety concern risk rating matrix below. The qualitative assessment requires professional judgement and a wide range of experience in projects of all sizes and locations.

		Severity outcome			
		Non-injury	Minor	Serious	Fatal
		Property damage only (PDO)	Injury which is not 'serious' but requires first aid, or which causes discomfort or pain to the person injured.	Injury (fracture, concussion, severe cuts or other injury) requiring medical treatment or removal to and retention in hospital.	A death occurring as the result of injuries sustained in a road crash within 30 days of the crash.
Probability of a crash	Very likely	Minor	Moderate	Serious	Serious
	Likely	Minor	Moderate	Serious	Serious
	Unlikely	Minor	Minor	Significant	Serious
	Very unlikely	Minor	Minor	Significant	Significant

Safe System injury threshold

Figure 1.3-1 - Safety Concern Risk Rating Matrix

1.4 Disclaimer

The findings and recommendations in this report are based on an examination of available relevant plans, the specified road and its environs, and the opinions of the SSA team. However, it must be recognised that eliminating safety concerns cannot be guaranteed since no road can be regarded as absolutely safe, and no warranty is implied that all safety issues have been identified in this report. Safe system audits do not constitute a design review nor an assessment of standards with respect to engineering or planning documents.

Readers are urged to seek specific technical advice on matters raised and not rely solely on the report.

While every effort has been made to ensure the report's accuracy, 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 Safe System Audit Details

2.1 Type of Audit

This report has been prepared in response to a request from Carterton District Council to carry out a Detailed Design Stage Safe System Audit (SSA) for the Norfolk Road Walking and Cycling Trail Project.

It has been confirmed by WTTG that no other Road Safety Audit (or Safe System Audit) has been undertaken for any other stage of this project.

A key driver of the SSA is the identification of hazards or deficiencies that can potentially result in serious and fatal crashes.

2.2 The Safety Audit Team

The safe system audit was carried out in accordance with the Waka Kotahi NZ Transport Agency Safe System Audit Guidelines, Road to Zero Edition – October 2022 by:

- s 7(2)(a) Urban Connection Limited, Wellington – Team leader
- s 7(2)(a) Urban Connection Limited, Hawke's Bay – Team member

2.3 Meetings and Site Inspections

The Safety Audit Team (SAT) reviewed the drawings/documentation on 12 January 2023. This was followed by a full site inspection during the daytime on 13 January 2023.

3 Project Description

3.1 Project Background and Objective

The project proposes constructing a multi-use (shared use) walking and cycling trail along Norfolk Road and Chester Road in the Carterton District. The trail is proposed to be predominately offset from the road carriageway and mostly flat.

On Norfolk Road, the project extends from David Lowes Lane (RP 0.990) to the Mount Holdsworth Road intersection (approx. RP 10.777). The trail crosses two road intersections (Chester and Maungahau Roads) throughout Norfolk Road, as well as crossing Norfolk Road itself.

On Chester Road, the project extends from the Norfolk Road intersection (RP 9.111) to the West Taratahi Community Hall (RP 7.140). The trail crosses one road intersection (Parkers Road) throughout Chester Road.

The project aims to improve vulnerable road users' safety and offer locals and visitors another option in Wairarapa's trail network.

3.2 Existing Conditions and Context

The existing conditions and context of the sections subject of this assessment are as follows:

- Norfolk Road, from approximately RP 0.990 to RP 10.777, in the Carterton District Council area.
    - Norfolk Road has a recorded annual average daily traffic (AADT) ranging from 482 to 1,450 vehicles per day (vpd) (MobileRoad 2022), with 4.3 to 12% of heavy vehicles;
- Chester Road, from approximately RP 7.140 to RP 9.111, in the Carterton District Council area.
    - Chester Road has a recorded annual average daily traffic (AADT) ranging from 336 to 517 vpd (MobileRoad 2022), with 5.6 to 10% of heavy vehicles;
    - Chester Road provides a secondary route to Norfolk Road;
- These roads have the following characteristics:
    - Provide the connection to the rural portion west of SH2 between Masterton and Carterton. They also provide access to the Tararua Forest Park, West Taratahi and Mount Holdsworth. Typical road users consist of residents travelling/commuting to and from townships in the Wairarapa region. The adjoining roads are rural connectors;
    - The posted speed limit is 100 km/h;
    - The section throughout the site is rural and rural residential;
    - The alignment is largely straight and flat, with moderate curves; and
    - The typical cross-section throughout this road is two-lane two-way with no sealed shoulders.

3.3 Proposed Works

The project proposes the following improvements.

- Construction of an off-road walking and cycling trail along Norfolk and Chester Roads.

The SSA team has been provided with the following documents for this audit:

- Norfolk Road Trail – Mapping Requirements – Document version 1.0 – Dated 25 November 2022 (received on 1 December 2022)

4 Assessment of Safe System Alignment

4.1 Safe System Assessment Summary

The Safe System Assessment Matrix scores for the existing conditions and the proposed design options are shown in Table 4.1-1. The scores for each crash type are shown in Figure 4.1-1. The detailed assessments are presented in Appendix A.

Only pedestrian and cyclist crash types have been assessed for scoring purposes due to the fact that no changes are proposed to the road carriageway. The presence of cyclists and pedestrians in the existing condition could potentially adversely affect run-off-road and head-on crash types due to swerving to avoid a collision with these users. However, as the existing volumes of these users are minimal (likely less than 10 units per day), there would be a negligible change in crash probability. Therefore, the project is expected not to affect other crash types for Safe System scoring purposes.

Table 4.1-1 - Safe System Assessment Score Summary

Option	Score – Existing	Score – Proposed
Norfolk Road Trail	24 / 128	24 / 128

Figure 4.1-1 - Safe System Assessment Score Summary

The Safe System Assessment (SSA) shows that the scores for the existing and proposed situation are the same. However, some considerations are required to be made as the project is considered a significant improvement for these vulnerable road user's categories, as follows:

- The scores for the existing conditions are driven by a low road user exposure of fewer than 10 units per day for each pedestrian or cyclist user type. The proposal is expected to result in more pedestrians and cyclists through these roads, increasing the road user exposure to moderate (10 to 50 units per day for each user category). This results in an increase in scores for the proposed project;

- The crash probability (likelihood) for the existing situation has been assessed as 'Likely' due to primarily the lack of dedicated facilities for pedestrians and cyclists, which puts them at risk of being struck by vehicles on a relatively narrow road with no sealed shoulders and high operating speeds. This is considered substantially changed for the proposed condition, which has a probability assessed between 'Highly Unlikely' and 'Unlikely', due to the dedicated facilities predominantly separated from the road carriageway;

- The severity scores for both the existing and proposed conditions are the same (highly likely to result in a fatality or serious injury) due to the potentially high impact speeds for any crash involving these vulnerable road users that significantly exceeds Safe System speeds (20-30 km/h).

5 Safety Concerns

5.1 Crash History

The crash history of the site was assessed to assist the SSA team in understanding the safety performance of the site and its immediate surroundings. A 10-year CAS assessment was undertaken from 2013 through 2022, including 2023 to date, within the limits of the project on both Norfolk Road and Chester Road. The crash location maps are shown in Figure 5.1-1, and the summary of the crashes is presented in Table 5.1-1.

Figure 5.1-1 – Extent of safety assessment and crash locations

Table 5.1-1: Crash Summary 2013 – 2023 (to date)

Crash Severity	Norfolk and Chester Roads	
	Frequency	Casualties
Fatal	0	0
Serious	1	1
Minor Injury	9	12
Non-injury	8	-
Total	**18**	**13**

Crash Type		Environment		
Overtaking crashes	5.6% (1)	Natural light conditions	Light/overcast	66.7%
Straight road lost control/head-on	38.9% (7)		Dark/twilight	33.3%
Bend lost control/head-on	27.8% (5)	Road conditions	Dry	66.7%
Read end/obstruction	22.2% (4)		Wet	27.8%
Crossing/turning	5.6% (1)		Ice or Snow	5.6%
Others	0%	**Intersection/midblock**		
Involved motorcyclists	0%	Intersection		16.7%
Involved pedestrians/cyclists	0%	Midblock		83.3%

There have been 18 crashes along these sections of Norfolk Road and Chester Road in the last 10 years. No crashes involved vulnerable road users (pedestrians or cyclists). Five crashes have occurred on Chester Road and 13 crashes on Norfolk Road.

On Norfolk Road, one was a serious-injury crash, six were minor-injury crashes and six were non-injury crashes. On Chester Road, three minor-injury crashes and two non-injury crashes were recorded.

Loss of control type crashes adds up to approximately 67% (12 crashes) of the crashes. The majority of the crashes have occurred in dry and good light conditions.

5.2 Summary of findings

The frequency of risk rankings associated with this Safe System Audit is provided below, with the detailed findings to follow. This summary illustrates the degree of consideration that should be given when working through the findings.

Table 5.2-1: Summary of Findings

Serious	Significant	Moderate	Minor	Comment	Total
-	4	-	4	1	9

5.3 General Safety Concerns

5.3.1 Speed environment **Significant**

The posted speed limit throughout Norfolk Road and Chester Road is 100 km/h. Due to the predominantly flat and straight alignment, traffic operating speeds are expected to be similar to the posted speed limit. Note that the Safe and Appropriate Speed for these roads in Waka Kotahi's MegaMaps is 60 km/h.

The operating speed of 100 km/h exceeds the Safe System speed, the maximum survivable speed upon impact where the chance of death is less than 10%, for all crash types. More importantly and relevant to this project, the operating speed substantially exceeds the limits to the biomechanical tolerances of the human body for vulnerable/unprotected road users (pedestrians and cyclists). A Safe System speed of 30 km/h is the tolerable limit for these users.

It is acknowledged that this project is considered a significant benefit in relation to the existing conditions. The dedicated path/trail for these vulnerable road users, mostly offset from the carriageway, is expected to result in a very unlikely probability of these crash types occurring.

Speed management is a proven measure to reduce both the likelihood and severity of crashes. While a reduction in speed limit to 60km/h is still likely to result in a death or serious injury (DSI), the reduction in speed will reduce the likelihood of a crash by providing improved reaction times and improving other considerations such as sight and stopping distance.

The auditors are aware that the Carterton District Council plans to reduce the posted speed limit throughout these roads.

Recommendation:

1. *Consider reducing the posted speed limit throughout Norfolk Road and Chester Road*

Probability Rating: **The probability of a crash *is* Very Unlikely**	***Severity Outcome Rating:*** ***Crashes are likely to be*** **Fatal**
Design Team Response: Click here to enter text.	
Safety Engineer: Click here to enter text.	
Client Decision: Click here to enter text.	
Action Taken: Click here to enter text.	

5.3.2 Path separation from the road carriageway — Significant

The designed path is proposed to be 2 m wide and with a 3 m separation from the road carriageway for most of its extension. However, in some locations, there are pinch points which reduce the separation distance, as follows:

- 605 – 606 Norfolk Road: 2 m separation;
- 666 Norfolk Road: nil separation (refer to Figure 5.3-1);
- 748 Norfolk Road: 0.5 m separation (refer to Figure 5.3-2);
- 889 Norfolk Road (Chester Road intersection): 1.5 m separation;
- Atiwhakatu single-lane bridge: on-road;
- Intersection corners at Maungahau Road and Parkers Road: unclear/unknown separation.

At these locations, trail users are closer to or on the road carriageway, therefore, being more susceptible to being hit by vehicles. This condition increases the probability of crashes involving these vulnerable road users at relatively high speeds, which could lead to a DSI. Note that the probability of crashes is still very unlikely at those points due to their typically short nature and low to moderate traffic and vulnerable road users volumes on these roads.

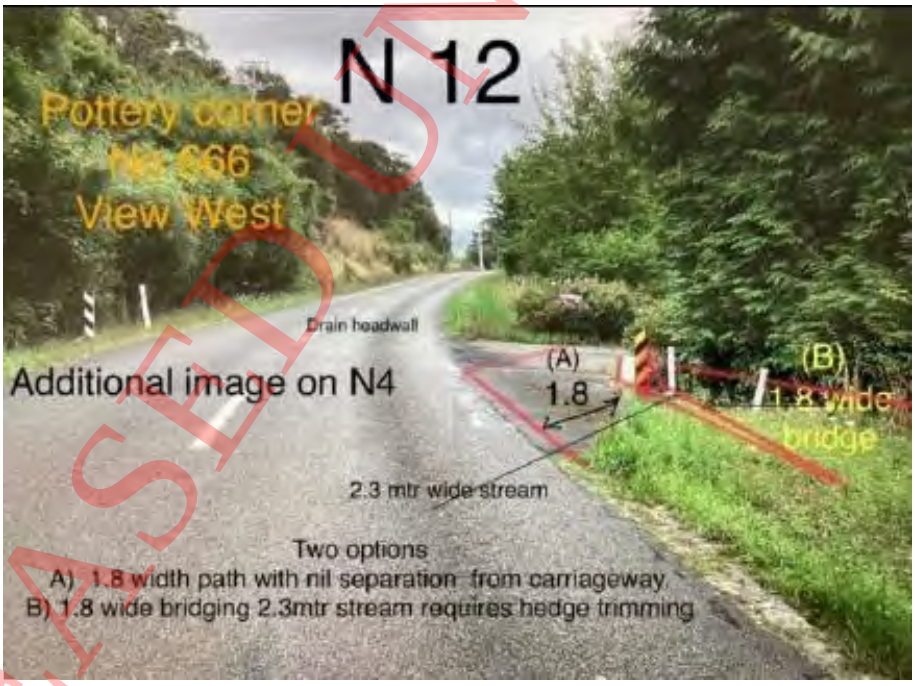

Figure 5.3-1 – Separation at 666 Norfolk Road (extract from concept design report)

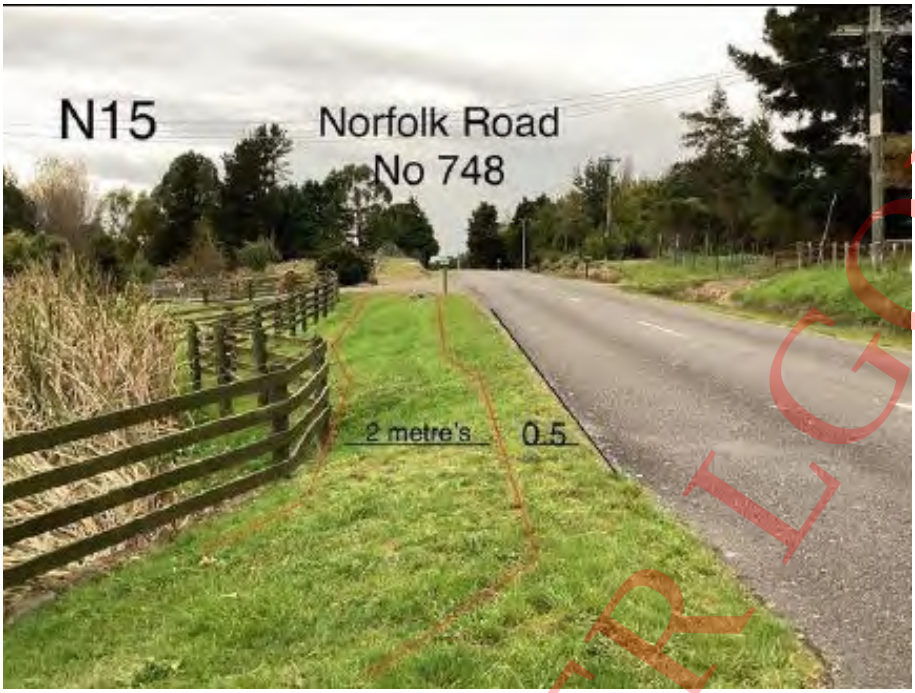

Figure 5.3-2 – Separation at 748 Norfolk Road (extract from concept design report)

Recommendation:

1. *Provide kerb separators with safe-hit posts wherever the path is less or equal to 1.5 m from the road carriageway (example below);*

2. *Reduce the path width for short distances to accommodate the kerb separators with safe-hit posts if required (i.e., 666 Norfolk Road);*
3. *Consider boundary relocation to allow a uniform separation through the route;*
4. *Consider extending the existing culvert to accommodate the path at 666 Norfolk Road;*
5. *Provide warning signage (highlighting the presence of cyclists and/or pedestrians) at all pinch points, including the Atiwhakatu single-lane bridge.*

Probability Rating: ***The probability of a crash is* Very Unlikely**	***Severity Outcome Rating:*** ***Crashes are likely to be* Fatal**
Design Team Response: Click here to enter text.	
Safety Engineer:	Click here to enter text.
Client Decision:	Click here to enter text.
Action Taken:	Click here to enter text.

5.3.3 Intersection control Significant

Currently, the Norfolk Road/Maungahau Road intersection is give-way controlled. Chester Road/Parkers Road intersection has no control. A limit line is marked at the latter, but no signs or other markings are provided. These intersections have been found to have incorrect control in place.

As per the existing conditions, both intersections are required to be stop-controlled, given that appropriate visibility is not achieved from a point 9 m from the limit line (refer to MOTSAM Section 3.10.01).

This condition increases the probability of crashes (typically side-impact) at these intersections. The probability is still considered unlikely due to relatively low traffic volumes on these roads. However, any crash would likely result in a DSI.

Furthermore, in this condition, where vegetation blocks visibility in the vicinity of the intersections, the intervisibility between pedestrians/cyclists and vehicles is, likewise, restricted. This increases the probability of issues involving these road users.

Figure 5.3-3 – Visibility from 9 m from the limit line at the Chester Road/Parkers Road intersection

Recommendation:

1. *Improve visibility at these intersections by vegetation removal/trimming;*
2. *Consider updating the intersection control to stop-controlled;*

Probability Rating: *The probability of a crash is* **Unlikely**	*Severity Outcome Rating:* *Crashes are likely to be* **Serious**
Design Team Response: Click here to enter text.	
Safety Engineer:	Click here to enter text.
Client Decision:	Click here to enter text.
Action Taken:	Click here to enter text.

5.3.4 Single-lane bridge (Atiwhakatu Bridge) Significant

Trail users will be required to travel through the Atiwhakatu single-lane bridge, changing from an off-road to an on-road path configuration over the approximately 23 m long bridge. This condition puts vulnerable road users at risk of being struck by vehicles at this point.

The risk of this issue occurring is very unlikely due to relatively low traffic volumes and good forward visibility from both directions. However, considering the high operating speed on Norfolk Road, any crash involving pedestrians/cyclists would likely result in a DSI.

Furthermore, the bridge's side barriers are broken in some sections and present deterioration signs. Due to increased pedestrians/cyclist's volumes, this device is important in protecting against the drop-off into the water hazard.

Figure 5.3-4 – Atiwhakatu Bridge

Recommendation:

1. *Provide warning signage on the bridge's approaches (i.e., cyclists merging, beware of cyclists);*
2. *Consider an ITS solution, such as an electronic warning sign (traditional signage may lose its effect quickly)*
3. *Repair the bridge's barriers;*

Probability Rating: ***The probability of a crash is* Very Unlikely**	***Severity Outcome Rating:*** ***Crashes are likely to be* Fatal**
Design Team Response: Click here to enter text.	
Safety Engineer:	Click here to enter text.
Client Decision:	Click here to enter text.
Action Taken:	Click here to enter text.

5.3.5 Hazards **Minor**

Some locations through the proposed project alignment have been identified to present hazards that can potentially injure trail users. These hazards are listed below:

- Drop-off hazard on Norfolk Road from approximately RP 6.045 to 6.300 (refer to Figure 5.3-5);
- Drop-off into the water hazards on culverts/water races at 570, 666, 855 Norfolk Road and 792 Chester Road (refer to Figure 5.3-6);
- Overhung vegetation for a significant portion of these roads (refer to Figure 5.3-7);
- Letterboxes throughout these roads that are within or immediately adjacent to the proposed path (refer to Figure 5.3-8). Particular regard has to be taken in relation to non-frangible and/or rigid letterboxes, for instance, as identified at 315 Norfolk Road (refer to Figure 5.3-9). These structures are a hazard not only for cyclists but for vehicles, increasing the severity of injuries in the case of an errant manoeuvre.

Figure 5.3-5 – Drop-off at Norfolk Road RP 6.150

Figure 5.3-6 – Drop-off into the water at [redacted] Chester Road (RP 8.050)

Figure 5.3-7 – Overhung vegetation

Figure 5.3-8 – Letterboxes on Norfolk Road

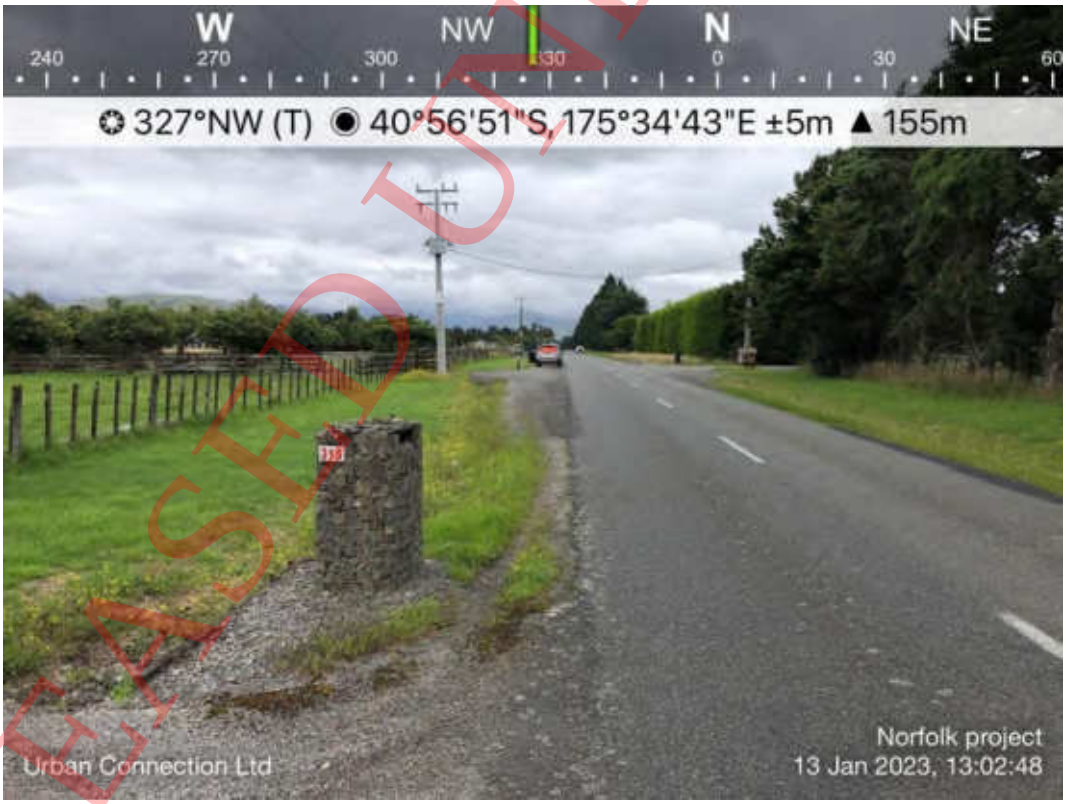

Figure 5.3-9 – Rigid letterbox at 315 Norfolk Road

The locations mentioned above are indicative only and may not contain all points that can present a hazard to trail users – these points must be identified by the designer.

Given the relatively low travelling speed for cyclists, there is potentially a low chance of serious and fatal injuries. Nevertheless, the provision of a safe walking and cycling trail comprises minimising any risks identified through the protection and/or removal of hazards.

Recommendation:

1. *Identify all locations/objects that present a hazard for trail users;*
2. *Provide cycle fence/rails to protect against the hazards;*
3. *Relocate letterboxes to suitable locations;*
4. *Remove and relocate rigid letterboxes, switching them to frangible-type letterboxes.*

Probability Rating: ***The probability of a crash is*** **Unlikely**	***Severity Outcome Rating:*** ***Crashes are likely to be*** **Minor**
Design Team Response: Click here to enter text.	
Safety Engineer: Click here to enter text.	
Client Decision: Click here to enter text.	
Action Taken: Click here to enter text.	

5.3.6 Treatment at intersections Minor

The design proposes to adopt a give-way treatment at the three path crossings throughout the route listed below:

- Norfolk Road/Maungahau Road intersection;
- Norfolk Road/Chester Road intersection;
- Chester Road/Parkers Road intersection.

A horizontal deflection is proposed from Norfolk Road onto both Maungahau and Chester Roads, with the path crossing somewhat 20-30 m from the intersections. A straight crossing path is proposed through Parkers Road. The proposed layouts are shown in Figure 5.3-10.

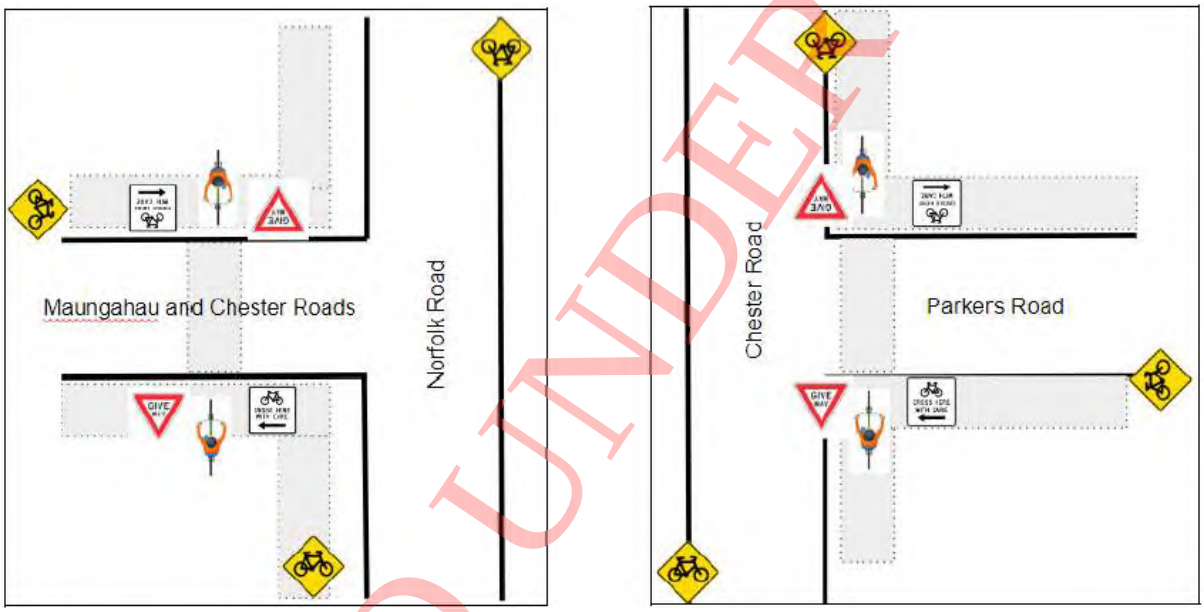

Figure 5.3-10 – Treatment at intersections

Some safety concerns have been identified in relation to the proposed layouts, as follows:

- The crossing layout on Maungahau and Chester Roads increases the travelled path for trail users through Norfolk Road, and, therefore, it is not considered the natural path (desire line) to be followed by users. Some cyclists/pedestrians could be expected to travel straight through the intersection to avoid the longer path on the side road. This could potentially generate conflicts with vehicles that would not be expected users at that point;
- The crossings on Maungahau and Chester Roads (20-30 m from Norfolk Road) result in restricted intervisibility between cyclists/pedestrians and vehicles turning from Norfolk Road. It is noted, however, that these vehicles would be expected to generally be turning out from Norfolk Road with relatively low speeds, which provides some form of mitigation;
- Conversely, at the Chester Road/Parkers Road intersection, the straight-through path crossing establishes the concern for path users shooting through the intersection, which currently has substandard visibility (as in Section 5.3.3);

- In the vicinity of the intersections, the trail could also be expected to have less separation from the carriageway, increasing the chances for errant turning vehicles encroaching over the path. It could also mean that errant cyclists could encroach onto the road while turning, especially in wet conditions. These conditions increase the probability of conflicts involving these users;

The considered ideal configuration for these crossings would consist of some horizontal deflection to slow down cyclists before the crossing points whilst not being far away from the main road to ensure good intervisibility between cyclists/pedestrians and vehicles. Kerb separators would also be ideally included through the horizontal deflections and where the path is closer to the road to delineate and separate the road and trail (Refer Section 5.3.2), preventing vehicles from tracking over it. It also would assist in delineating the path to be followed for cyclists, preventing them from going straight through the intersections.

Given the relatively low traffic and path users volumes and speeds, the probability of the issues above is unlikely. Relatively low turning and approaching speeds establish a low chance of serious and fatal injuries. Nevertheless, the provision of a safe walking and cycling trail comprises minimising any risks identified in this report.

Recommendation:

1. *Provide kerb separators (with safe-hit posts) to delineate the vicinity of the trail crossings;*
2. *Consider providing a short horizontal deflection, with crossings closer to the main road to ensure good intervisibility between road users;*
3. *Consider adopting raised safety platforms on path crossings to reduce vehicles speeds and highlight the crossing;*

Probability Rating: ***The probability of a crash is*** **Unlikely**	***Severity Outcome Rating:*** ***Crashes are likely to be*** **Minor**
Design Team Response: Click here to enter text.	
Safety Engineer: Click here to enter text.	
Client Decision: Click here to enter text.	
Action Taken: Click here to enter text.	

5.3.7 Drainage/Stormwater control Minor

At the Norfolk Road/Chester Road intersection, stormwater runoff was accumulated at the intersection's corner during the site visit. Therefore, it is assessed that stormwater is not being appropriately directed and conveyed into the drainage system. The following safety issues have been identified as a result:

- Cyclists could be expected to have their stability adversely affected by this issue, which could lead to them falling off their bikes. This risk is increased by the trail's horizontal deflection at this point;
- Stormwater runoff could be expected to migrate onto the pavement during moderate to intense rainfall events. This could adversely affect the stability of turning vehicles due to aquaplaning;
- Deficient drainage can lead to pavement defects (i.e., such as edge breaks and potholes). Deficient drainage at this point could also lead to the deterioration of the proposed trail.

Figure 5.3-11 – Stormwater runoff at the Norfolk Road/Chester Road intersection

Recommendation:

1. *Ensure that this drainage deficiency is repaired.*

Probability Rating: *The probability of a crash is* **Unlikely**	*Severity Outcome Rating:* *Crashes are likely to be* **Minor**
Design Team Response: Click here to enter text.	
Safety Engineer:	Click here to enter text.
Client Decision:	Click here to enter text.
Action Taken:	Click here to enter text.

5.3.8 Visibility at Norfolk Road/Mt Holdsworth intersection — Minor

The forward visibility at the Norfolk Road/Mt Holdsworth Road/Blakes Road intersection has been assessed as deficient. Assuming a vehicle waiting to turn right onto Blakes Road, the following vehicle could hit this vehicle from behind (rear-end crash) due to the above deficiency (red arrow below). Some increase in right-turn volumes, although relatively minor, can be expected to occur at this intersection due to the parking area proposed on Blakes Road, which could indicate some increase in risk.

However, it is noted that the turning volumes at this intersection are still considered relatively low. This establishes an unlikely probability of crashes. Moreover, the relatively low turning speeds due to the horizontal curve and low impact angles suggest a low DSI crash risk.

Figure 5.3-12 – Norfolk Road/Mt Holdsworth intersection forward visibility

Recommendation:

1. *Provide road width for a following northwest-bound vehicle to pass a vehicle turning right onto Blakes Road by means of either road widening or adjustments to the existing centreline markings.*

Probability Rating: *The probability of a crash is* **Unlikely**	*Severity Outcome Rating:* *Crashes are likely to be* **Minor**
Design Team Response: Click here to enter text.	
Safety Engineer:	Click here to enter text.
Client Decision:	Click here to enter text.
Action Taken:	Click here to enter text.

5.3.9 Signage and road markings Comment

New signage and road markings throughout the route are predominantly unclear at this stage. This is considered essential to highlight the presence of vulnerable road users on these roads, especially on path crossings, pinch points and locations where intervisibility between vehicles and pedestrians/cyclists is substandard. Appropriate signage/markings can assist in decreasing the likelihood of conflicts between road users.

Recommendation:

1. *Identify and mark high-use driveways as per Waka Kotahi's Design Guidance Note (i.e., High-use driveway treatment for cycle paths and shared paths);*
2. *Provide suitable warning signage for vehicles and pedestrians/cyclists approaching pinch points and path crossings;*
3. *Provide wayfinding signage throughout the route;*
4. *Provide warning signage throughout the route, especially in locations where intervisibility between road users is substandard.*

Probability Rating: ***The probability of a crash is*** **N/A**	***Severity Outcome Rating:*** ***Crashes are likely to be*** **N/A**
Design Team Response: Click here to enter text.	
Safety Engineer: Click here to enter text.	
Client Decision: Click here to enter text.	
Action Taken: Click here to enter text.	

6 Safe System 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 problems identified have been noted in this report.

Signed: s 7(2)(a) Date: 8 February 2023

s 7(2)(a) MET, CMEngNZ (Eng. Technician)
Principal Transport Engineer, Urban Connection Limited

Signed: s 7(2)(a) Date: 8 February 2023

s 7(2)(a) BEng (Civil), GradDipEng (Highways)
Transport Engineer, Urban Connection Limited

Designer:	*Name:*	*Position:* .....
	Signature……	*Date*……..
Safety Engineer:	*Name:*	*Position:* .....
	Signature……..	*Date*……..
Project Manager:	*Name:*	*Position:* .....
	Signature……	*Date*……..
Action Completed:	*Name:*	*Position:* .....
	Signature……..	*Date*……..

Project Manager to distribute audit report incorporating decision to the designer, Safety Audit Team Leader, Safety Engineer, and project file.

Date: ……

Appendix A – Safe System Assessment Matrix

Table 5.3-1 – Safe System Assessment Matrix – *Existing*

	Run-off-road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure comments:	Not applicable. Walking/cycling project with no changes to existing road carriageway.	Not applicable. Walking/cycling project with no changes to existing road carriageway.	Not applicable. Walking/cycling project with no changes to existing road intersections.	Not applicable. Walking/cycling project with no changes to existing road carriageway.	Data is not available. Presently, pedestrians are rarely expected to walk through Norfolk or Chester Roads. Assumed low exposure of fewer than 10 pedestrians per day.	Data is not available. Presently, cyclists are rarely expected to cycle through Norfolk or Chester Roads. Assumed low exposure of fewer than 10 cyclists per day.	Not applicable. Walking/cycling project with no changes to existing road carriageway.
Exposure score:	0 / 0	0 / 0	0 / 0	0 / 0	1 / 4	1 / 4	0 / 0
Likelihood comments:		Not applicable.	Not applicable.	Not applicable.	Factors that increase the likelihood include: - High traffic operating speeds (≥ 80 km/h); - No dedicated pedestrian facilities (footpaths); - No sealed shoulders; - No pedestrian crossing facilities at intersections; - Pedestrians are required to walk on (or near) the road on some sections; - No lighting; - No mid-block pedestrian crossings; - Overhung trees on berms; - Overgrown vegetation on berms; - Moderate to high vehicle crossing density; - Some visibility restrictions on vehicle crossings; - Single-lane bridge; Factors that decrease the likelihood include: - Moderate traffic volumes; - Low intersection density; - Good forward visibility;	Factors that increase the likelihood include: - High traffic operating speeds (≥ 80 km/h); - No dedicated cycling facilities; - No sealed shoulders; - Relatively narrow carriageway; - Cyclists are required to shared the road with vehicles; - No cycle treatment at intersections; - No lighting; - Moderate to high vehicle crossing density; - Some visibility restrictions on vehicle crossings; - Single-lane bridge; Factors that decrease the likelihood include: - Moderate traffic volumes; - Low intersection density; - Good forward visibility; - Flat and straight alignment;	Not applicable.
Likelihood score:	0 / 0	0 / 0	0 / 4	0 / 0	3 / 4	3 / 4	0 / 0
Severity comments:	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Factors that increase the severity include: - High operating speeds (≥ 80 km/h); - Moderate to high volume of heavy vehicles (4.3 to 12%); Factors that decrease the severity include: - None identified;	Factors that increase the severity include: - High operating speeds (≥ 80 km/h); - Moderate to high volume of heavy vehicles (4.3 to 12%); Factors that decrease the severity include: - None identified;	Not applicable.
Severity score:	0 / 0	0 / 0	0 / 0	0 / 0	4 / 4	4 / 4	0 / 0
Product:	**0 / 0**	**0 / 0**	**0 / 0**	**0 / 0**	**12 / 64**	**12 / 64**	**0 / 0**
						TOTAL	**24 / 128**

Table 5.3-2 - Safe System Assessment Matrix – *Proposed*

	Run-off-road	Head-on	Intersection	Other	Pedestrian	Cyclist	Motorcyclists
Exposure comments:	Not applicable. Walking/cycling project with no changes to existing road carriageway.	Not applicable. Walking/cycling project with no changes to existing road carriageway.	Not applicable. Walking/cycling project with no changes to existing road intersections.	Not applicable. Walking/cycling project with no changes to existing road carriageway.	Data is not available. ~~Presently, pedestrians are rarely expected to walk through Norfolk or Chester Roads. Assumed low exposure of fewer than 10 pedestrians per day.~~ The proposed paths are expected to increase the number of pedestrians. Assumed moderate exposure of 10-50 pedestrians per day.	Data is not available. ~~Presently, cyclists are rarely expected to cycle through Norfolk or Chester Roads. Assumed low exposure of fewer than 10 cyclists per day.~~ The proposed paths are expected to increase the number of cyclists. Assumed moderate exposure of 10-50 cyclists per day.	Not applicable. Walking/cycling project with no changes to existing road carriageway.
Exposure score:	0 / 0	0 / 0	0 / 0	0 / 0	2 / 4	2 / 4	0 / 0
Likelihood comments:	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Factors that increase the likelihood include: - High traffic operating speeds (≥ 80 km/h); ~~- No dedicated pedestrian facilities (footpaths);~~ - No sealed shoulders; ~~- No pedestrian crossing facilities at intersections;~~ ~~- Pedestrians are required to walk on (or near) the road on some sections;~~ - No lighting; - No mid-block pedestrian crossings; ~~- Overhung trees on berms;~~ ~~- Overgrown vegetation on berms;~~ - Moderate to high vehicle crossing density; - Some visibility restrictions on vehicle crossings; - Single-lane bridge; Factors that decrease the likelihood include: - Moderate traffic volumes; - Low intersection density; - Good forward visibility; - Dedicated walking facility; - Path is mostly separated from road carriageway; - Path crossing treatment at intersections; - Path is to have vegetation maintenance;	Factors that increase the likelihood include: - High traffic operating speeds (≥ 80 km/h); ~~- No dedicated cycling facilities;~~ - No sealed shoulders; - Relatively narrow carriageway; ~~- Cyclists are required to shared the road with vehicles;~~ ~~- No cycle treatment at intersections;~~ - No lighting; - Moderate to high vehicle crossing density; - Some visibility restrictions on vehicle crossings; - Single-lane bridge; Factors that decrease the likelihood include: - Moderate traffic volumes; - Low intersection density; - Good forward visibility; - Flat and straight alignment; - Dedicated cycling facility; - Path is mostly separated from road carriageway; - Path crossing treatment at intersections; - Path is to have vegetation maintenance;	Not applicable.
Likelihood score:	0 / 0	0 / 0	0 / 0	0 / 0	1.5 / 4	1.5 / 4	0 / 0
Severity comments:	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Factors that increase the severity include: - High operating speeds (≥ 80 km/h); - Moderate to high volume of heavy vehicles (4.3 to 12%); - Separation may reduce impact speeds, but still well above survivable speeds. Factors that decrease the severity include: - None identified;	Factors that increase the severity include: - High operating speeds (≥ 80 km/h); - Moderate to high volume of heavy vehicles (4.3 to 12%); - Separation may reduce impact speeds, but still well above survivable speeds. Factors that decrease the severity include: - None identified;	Not applicable.
Severity score:	0 / 0	0 / 0	0 / 0	0 / 0	4 / 4	4 / 4	0 / 0
Product:	**0 / 0**	**0 / 0**	**0 / 0**	**0 / 0**	**12 / 64**	**12 / 64**	**0 / 0**
						TOTAL	**24 / 128**

Norfolk Road Trail Concept Design Stage SSA_Rev1

Document Status FINAL

Revision	Prepared by:	Reviewed by:		Approved by:		
		Name	Signature	Name	Signature	Date
1	s 7(2)(a)	s 7(2)(a)	s 7(2)(a)	s 7(2)(a)	s 7(2)(a)	08/02/2023

Appendix B

From: Martin Gould
Sent: Friday, 24 February 2023 1:14 pm
To: Glenda Seville
Subject: Thanks and Actions

Follow Up Flag: Follow up
Flag Status: Flagged

> **Caution:** This email originated from outside the council. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Kia ora Glenda,

Many thanks to Johannes, s 7(2)(a) and you for your time this morning. I appreciated the open and frank discussion. I noted the following actions:

Martin - Provide Glenda detail on the maintenance services post-construction.

Glenda - Consider what CDC procurement procedures this project would trigger with CDC as contracting entity.

Johannes - Read the safety audit against the design ("Mapping Document") and meet with Glenda 3 March re what report recommendations are required and what CDC could fund.

I am keen to retain 29 March as the date to ask Council for formal approval. Having this backing before we approach potential funders is critical.

Please call or email me if there are any questions.

--
Nga mihi nui
Martin

Martin Gould
m: s 7(2)(a)
l: LinkedIn