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Totara Street VRU Risk Assessment

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1. Background

Abley was engaged by Tauranga City Council (TCC) to undertake a risk profile assessment for vulnerable road users (VRUs) on Totara Street, to assist in evaluating a recognised safety concern with this corridor. This assessment generally follows the Urban KiwiRAP Road Assessment Programme (Urban KiwiRAP) methodology. In short, the assessment estimates the future risk of deaths or serious injuries (DSIs) involving VRUs based on the total number of VRU injury crashes that have occurred.

Collective Risk indicates the total exposure to risk of a DSI casualty among all VRUs, while Personal Risk indicates the risk of a DSI casualty for any one VRU using the corridor. Both the Collective Risk and Personal Risk for VRUs have been evaluated in this assessment. VRU risk bands have not been defined in Urban KiwiRAP. For the purpose of this assessment, the approach used for Active Road Users (ARU) has been adopted, with the thresholds shifting on rating band for each value band used by all road users. For example, the VRU corridor Collective Risk thresholds of Medium High risk is equivalent to Medium Risk for all road users. Note that there is no 'Actual High' threshold for VRU.

2. Methodology

For this assessment, VRUs were inclusive of:

- Pedestrians,
- Cyclists,
- Motorcyclists,
- Moped users,
- Skateboarders, and
- Wheelchair users.

These road users have a higher risk of being killed or seriously injured when involved in a collision, when compared with drivers of cars and larger vehicles.

The extent of the assessment was Totara Street from the intersection with Hewletts Road (SH2) to the intersection with Rata Street. The section of Totara Street to the south of Hewletts Road was excluded as it has a very different environment and is not expected to have a similar volume or nature of traffic movements or VRU presence when compared with the main stretch of the street.

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The following steps were undertaken in order to estimate the risk profiles for VRUs on Totara Street:

1) Waka Kotahi's Crash Analysis System (CAS) was used to gather data on crashes on Totara Street from 2015 to 2019, inclusive (a five-year span). In accordance with the KiwiRAP procedure for corridors, these crashes were divided into two components:
   a) Intersection component: all crashes within 10m of the centroid of an intersection.
   b) Midblock component: all crashes not within 10m of the centroid of an intersection.
2) These crash records were filtered to exclude crashes that did not involve a VRU, or which did not result in an injury (minor, serious, or fatal). To determine VRU involvement, all 'Vehicle Type' and 'Movement Type' codes were examined.
3) With the number of injury crashes determined, the following factors were applied, based upon the type of VRU involved, to estimate the DSi Casualty Equivalent for each crash:
   a) Severity Indices (for the intersection component and the midblock component), and;
   b) Speed scaling factors (for a 60km/h speed limit)
4) The DSI Casualty Equivalent values were summed and Corridor Risk formulae applied to estimate the VRU Collective Risk and the VRU Personal Risk for Totara Street.
5) The risk values were then used to determine the risk level (Low, Medium Low, Medium, Medium High, or High) for VRU Collective Risk and VRU Personal Risk, using Urban KiwiRAP corridor risk thresholds.

3. Results

Two VRU injury crashes were recorded for the intersection component, and six VRU injury crashes were recorded for the midblock component. These included three crashes involving cyclists, and five crashes involving motorcycle or moped users. There was one fatal crash recorded – a midblock crash in which a moped user travelling south along the cycle lane on Totara Street was fatally injured by a truck turning right into a driveway. The other seven recorded crashes resulted in minor injuries.

The VRU Corridor Collective Risk value was calculated by summing the DSI Casualty Equivalents for both the intersection and midblock components, and dividing by the corridor length (km). The Collective Risk value was then scaled by the estimated VRU volume of 300 users per day[1] using Totara Street over 5 years in order to calculate the VRU Corridor Personal Risk. The results of these calculations and the risk categories that these values fall into are shown in **Table 3.1**.

Table 3.1 Totara Street VRU Collective and Personal Risk

	VRU Risk Value	VRU Risk Category
VRU Corridor Collective Risk	1.33	**Medium High**
VRU Corridor Personal Risk	242	**High**

The Collective Risk Category of Medium High indicates that Totara Street has a higher than average risk of a death or serious injury being sustained by a VRU compared to other corridors of the same length in New Zealand. The Personal Risk Category of High indicates that the risk of serious injury or death of any one individual VRU on Totara Street is significantly higher than that on a typical corridor of this length in New Zealand. As the Personal Risk is higher than the Collective Risk, there is a danger of a significant increase in deaths and serious injuries to VRUs if a greater number of vulnerable users were to travel on Totara Street; for example, if there was an increase in the numbers of cyclists or scooter users.

[1] Vulnerable Road User volume supplied by TCC