

# Waipawa Streets for People

SMART Safety Survey

October 2024 | 0.2 Draft





# Site Description

A new urban three-legged roundabout has been installed at the intersection of State Highway 2 (SH2) and Ruataniwha Street, with a new midblock pedestrian crossing installed north on SH2, including associated line marking improvements. SH2 is two-way, two-lane, with a flush median and some on-street parking on the western side of the highway. There are also various temporary devices installed, such as raised kerbs, platforms, and delineators. There is a shared path for both pedestrians and cyclists on the eastern side of SH2.



## Site Name:

State Highway 2 / Ruataniwha Street, Waipawa

## Client:

Central Hawke's Bay District Council

## Region:

Central Hawke's Bay, New Zealand

## Location:

Latitude -39.94470668081449

Longitude 176.58664585331823

## Survey Start:

20 August 2024

## Survey End:

28 August 2024

The SH2/Ruataniwha Street safety investigation forms part of the Streets for People Project undertaken by Central Hawke's Bay District Council along the main street, through the urban centre of Waipawa.

The project aims to create safer, healthier and more people-friendly streets so everyone can get to where they are going safely.

The purpose of this report is to identify and understand the areas of crash risk at the SH2/Ruataniwha Street site and to validate the recent improvements. The report will also make recommendations for further safety improvements.

## SMART Safety Survey

### What is it?

A SMART Safety Survey is a deep-dive Safe Systems analysis into road safety. As part of the survey, data is recorded via a stationary camera for a specified duration, for instance a week. The data is then analysed using artificial intelligence (AI) technology and video analytics. The factors used within the underlying algorithm include the vehicle type, the speed, the traffic, and even the angle the vehicle turns on as it passes through an intersection or corridor. It monitors near-misses, finds the trends of traffic behaviors, and provides insight into the likelihood and causes of crashes. This safety analysis method is a new approach pioneered by AMAG and performed throughout New Zealand by Urban Connection Ltd.





## Conflict Heat Map



The conflict heat map highlights the location and concentration of conflicts recorded over the week-long survey period. While the conflict rates were low, the results clearly shows a high density of conflicts where the adjacent approaches of the southbound through movement on SH2 crosses the eastbound circulating movements within the roundabout.

## Historical Crash Data



The NZ Transport Agency Crash Analysis System (CAS) database was used to obtain details of all crashes recorded for a 10-year period from 2014 to 2023 inclusive within the immediate vicinity of the intersection. The recorded crash history for the site is shown in the figure above, with 1 minor injury, and 3 non-injury crashes.

## Conflicts and Critical Conflicts

A traffic conflict is a situation where the paths of two or more vehicles, pedestrians, or other road users intersect or come close to the intersection, creating a potential collision or crash.

A critical conflict is defined as one or more road users having to take some level of evasive action to avoid a conflict. The significance of that conflict is a relationship between the available time to the collision (Time to Collision, TTC) and the resulting impact forces of the individual users involved (Delta-V).

Effectively, this technology constantly observes and measures the interactions between multiple users intricately and identifies road users who are on a potential collision course and need to take evasive action.

Ultimately, traffic conflicts are significant as they are potential precursors to crashes, and the closer to zero, the safer the transport system.





## Key Conflicts



### Adjacent-Approach Conflicts

**180**  
TOTAL

**2**  
CONFLICTS PER  
1000 USERS



### Pedestrian Conflicts

**10**  
TOTAL

**21**  
CONFLICTS PER  
1000 USERS

## Pedestrian Crossing

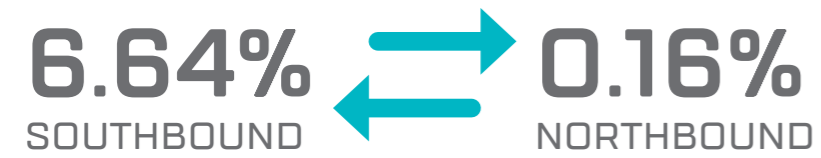
The survey results indicate that the recently installed pedestrian crossing is frequently used, as all recorded pedestrian movements followed the expected path, aligning with the pedestrian crossing on SH2 (as shown in the accompanying image). This suggests that the crossing provides a convenient and safe option for pedestrians.

Although the pedestrian conflict rate per 1000 users was the highest among all conflict types, the total number of recorded conflicts was low, with only 10 conflicts. Additionally, vehicle speeds during these conflicts were observed to be low and remained within Safe System tolerances for vulnerable road users, with speeds below 30 km/h. This suggests that, while conflicts exist, the risk of serious injury is minimised due to the low speeds at which they occurred.



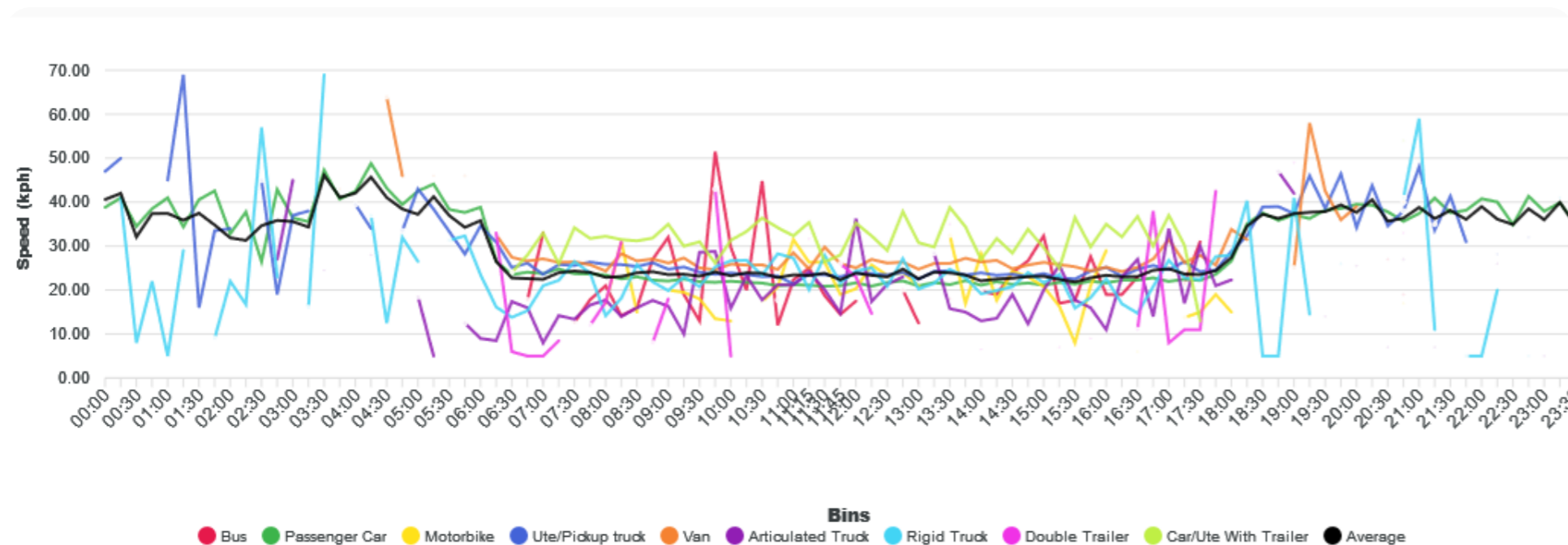
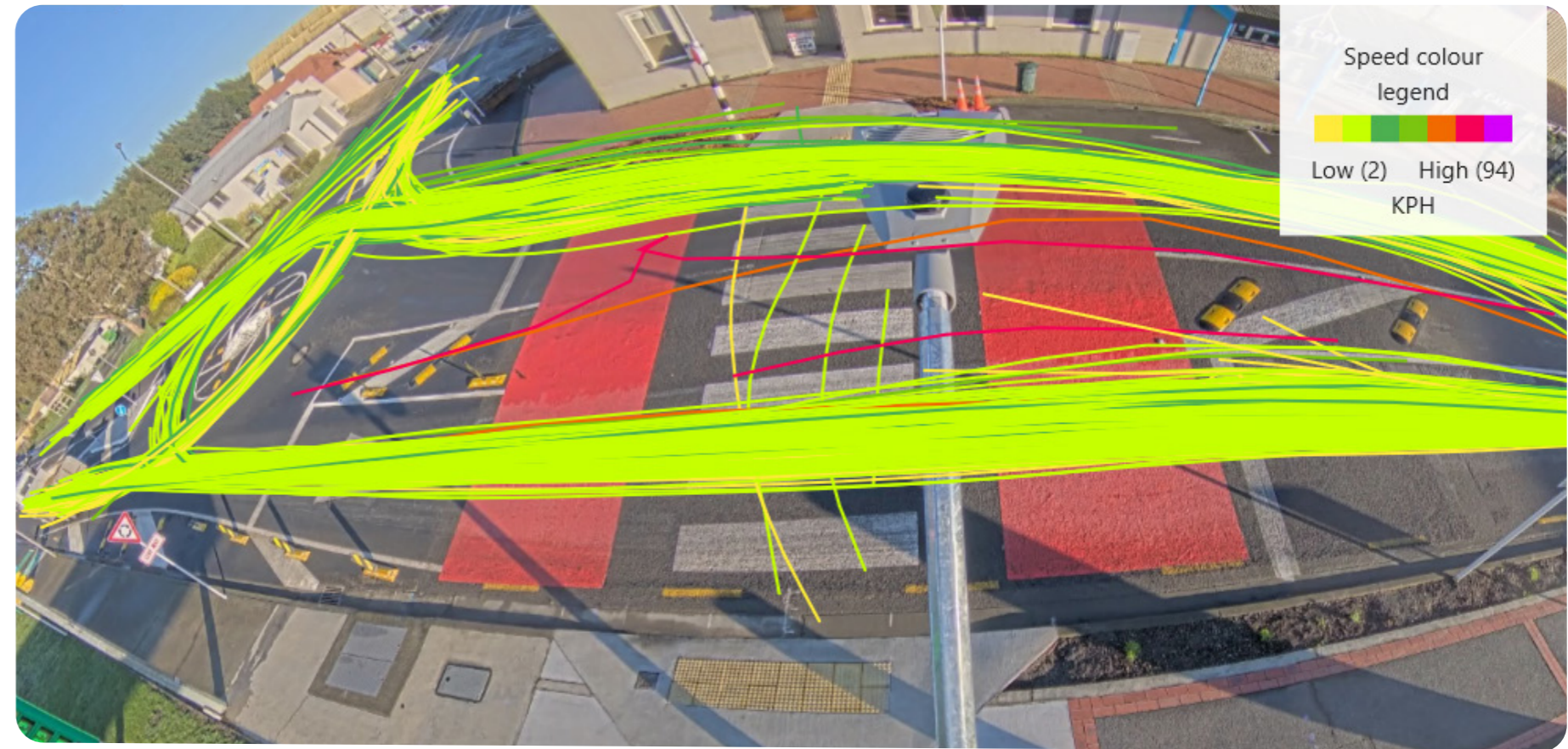
# Speeds

## SPEED VIOLATIONS



The survey results showed that speed violations, where a road user travelled 5km/h or more over the posted speed limit of 50km/h, occurred primarily on the southbound through and right movements (SH2). This is expected, as the approach is straight and there is very little deviation or deflection for straight through traffic approaching the roundabout on SH2.

It is important to note that the speed environment, particularly for through movements, exceeds the Safe System tolerances for vulnerable road users (i.e. impact speeds greater than 30km/h), which increases the likelihood of serious or fatal injury.



## SPEED PROFILE

The figure shows the speed profile for a 24-hour period averaged across the week-long survey period. It includes all movements, directions, and vehicle classes, with the black line representing an average overall.

It shows average speeds during the day (7:00am - 6:00pm) of between 20-30km/h, and at peak times the speeds are as low as 20km/h. Outside of peak times, the average speeds increase, however, they still remain less than 50km/h.

This is a slight reduction when compared to the mean operating speed of 51km/h along this length of SH2 through urban Waipawa, as described in NZ Transport Agency's MegaMaps Road to Zero Edition 2 platform.

# Summary

The SMART Safety Survey for the SH2 Ruataniwha Street mid-block crossing and intersection aimed to assess potential road safety risks and crash precursors as part of Central Hawke's Bay District Council's Streets for People project. This survey employed video analytics and AI to monitor near-misses, traffic movements, and speed behaviors over a week-long survey period.

The SMART Safety Survey technology proved effective in capturing critical traffic behaviors, particularly vehicle speeds and near-miss conflicts, enabling data-driven insights for improving urban intersection and pedestrian safety.

## Key Findings

### 1 Speed Observations

The average operating speeds ranged between 20-30 km/h during peak hours and less than 50km/h during off-peak hours, which is lower than expected for an urban highway in this environment. The highest speeds were recorded along SH2 southbound.

### 2 Conflict Patterns

The primary source of conflicts occurred between southbound vehicles on SH2 and vehicles circulating within the recently installed urban roundabout at Ruataniwha Street, which has low deflection and higher approach speeds.

### 3 Pedestrians

The new mid-block crossing was well used by pedestrians, and several conflicts were observed between pedestrians and through movements on SH2. While pedestrian conflict rates per 1000 users were the highest of all conflict rates, the total rate was low and speeds remained below 30km/h, which is within Safe System tolerances for vulnerable road users.

### 4 Night Driving

Although average operating speeds during the day were approximately 20-30 km/h, night-time speeds tended to be higher, particularly for southbound vehicles on SH2.

# Recommendations

## 1 Speed Management

The lower-than-expected speeds are likely a result of the recently installed improvements along SH2, including the mid-block pedestrian crossing and urban roundabout at Ruataniwha Street. While speeds increase in off-peak times, they are still lower than the previous average operating speeds along the corridor of 51km/h (MegaMaps II). Continue monitoring speeds, particularly at off-peak times.

## 2 Intersection Treatment

The speeds and predominant conflict between southbound vehicles on SH2 and vehicles circulating within the new roundabout indicates the need for additional safety improvements on SH2. Additional Primary Safe System interventions, such as installing raised platforms and permanent facilities, should be investigated in the long-term, with supporting treatments like better alignment and deflection mitigating potential crash risk in the short-term.

## 4 Pedestrian & Cyclist Safety

While the conflict rates for vulnerable road users were low, consideration should be given to improving the recently installed mid-block pedestrian crossing, particularly as pedestrian and cyclist traffic increases. Installing raised platforms and a raised median refuge at the mid-block crossing would benefit both the pedestrian crossing and the roundabout approach.

## 4 Further Monitoring

A follow-up survey during a summer may provide a more comprehensive view of pedestrian and cyclist interactions and help refine recommendations for longer-term safety improvements.



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