



BICYCLE
NETWORK®

Artificial Intelligence Road Surveys (AIRS)

Gisborne District Council

AIRS Study

Grey St, Gisborne, New Zealand

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Glossary

AIRS - Artificial Intelligence Road Survey

Countline - A line placed across a road or path in the AI software to count user volumes that pass across it.

Countshapes - A series of shapes drawn over a road or path in the AI software to count user volumes that pass between them and their movements.

Traceline - A line the AI software draws which traces individual road user's path across the field of vision.

Conflict Event - An incident detected using the AIRS methodology that has been viewed by Bicycle Network and judged to be a conflict between road or path users.

Event of Interest - An incident detected where a conflict didn't occur, but behaviour could cause risk to any user, or provides greater understanding of how the site is used.

Acknowledgment of Country

Bicycle Network acknowledges that we are tauiwi, undertaking this project on the land of the mana whenua. We acknowledge the iwi (tribal) authorities in Tairāwhiti, Gisborne, their historical and territorial rights over the land, and their special cultural and spiritual relationship with the environment.

Bicycle Network acknowledges the Wurundjeri and Bunurong Peoples as the traditional owners of the land on which this report was written, and pay our respects to their culture and elders, past and present, and their ongoing connection to land, waters and community.

About AIRS

Summary

Bicycle Network's Artificial Intelligence Road Survey (AIRS) program uses AI technology to detect and classify moving objects entering the camera's field of vision.

We identify and categorise nine road user categories including pedestrians, bicycles, motorcycles, cars, taxis, van/ute, bus and two types of articulate.

Aims and purposes

AIRS is designed to inform councils, transport groups and planners of the travel behaviour in urban spaces.

The program aims to answer some critical questions:

- Which user types are occupying the road, how many and at what times?
- What are the directions of movement? And what exact path did they take?

Methodology

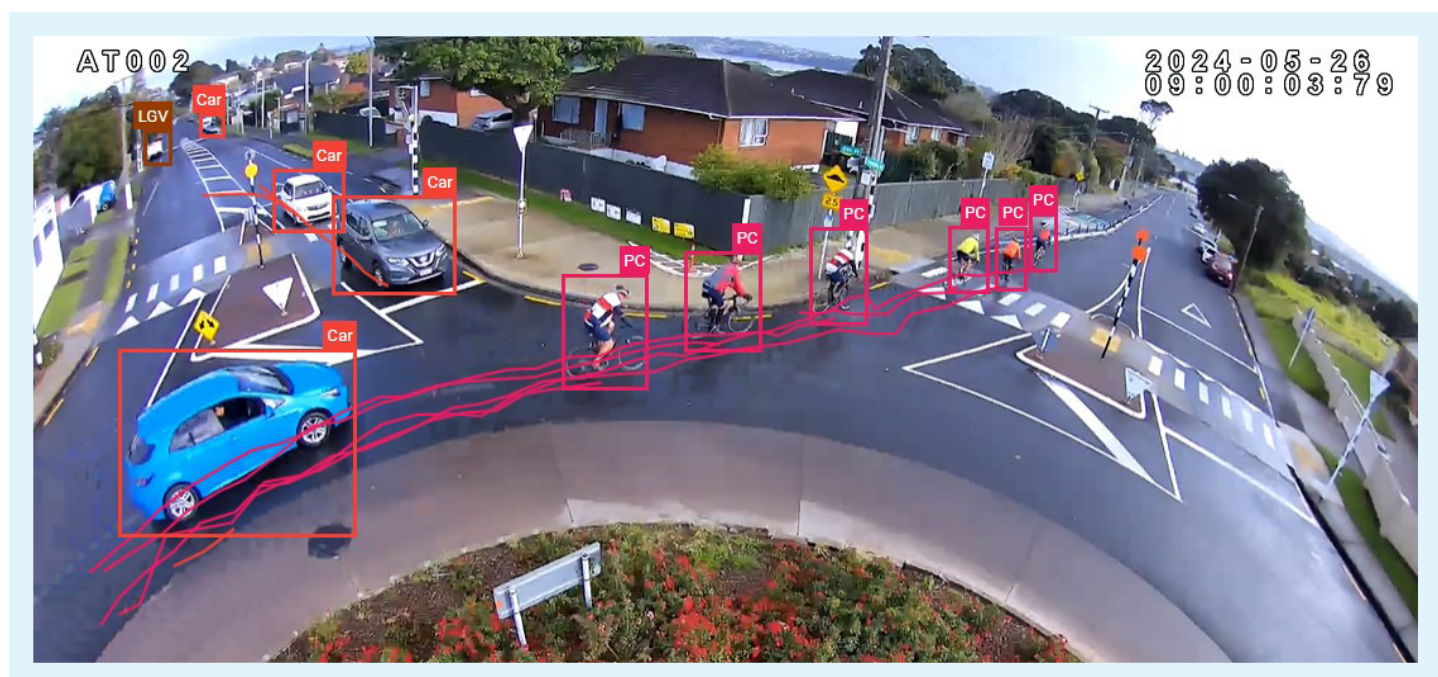


We use high-definition cameras to collect footage from sites of interest (step 1). The footage is then imported into an online portal that applies object detection AI to identify and classify road users (step 2).

Following a series of standard error-checking and quality control measures, we conduct a spatial analysis of the road (step 3).

Road user volumes, flow and directionality are extracted by placing a digital 'countline' or 'count shape' over the footage and the software counts all road user passing through or between those line or shapes.

Road users paths are traced ('tracelines'), which offers a spatial understanding of how road users interact in this space.



Background - Gisborne AIRS Study

Background

Bicycle Network was engaged by Gisborne District Council to undertake Artificial Intelligence Road Surveys (AIRS) analysis of Grey Street in Gisborne, (locations pictured in Image 1 below).

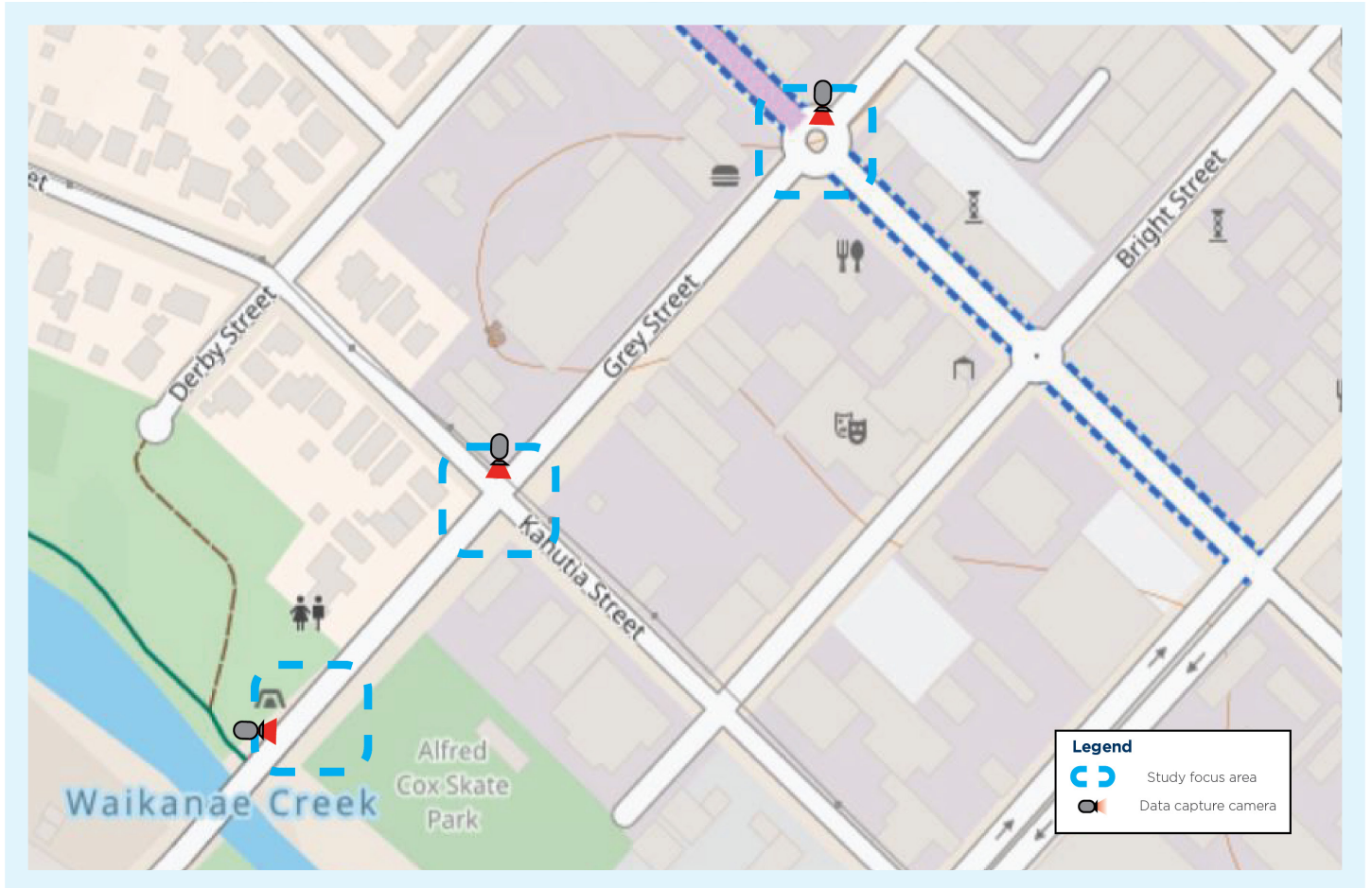


Image 1. Site locations of AIRS study along Grey St, at Kahutia St, Childers Rd and a pedestrian crossing near Alfred Cox skatepark.

Survey Aims

The survey was conducted across one week in August 2024, to understand travel volumes, patterns, and the use of the cycleway, footpaths and roads along Grey St.

The AIRS analysis was carried out to provide user tracelines, volumes, directionality and path types.

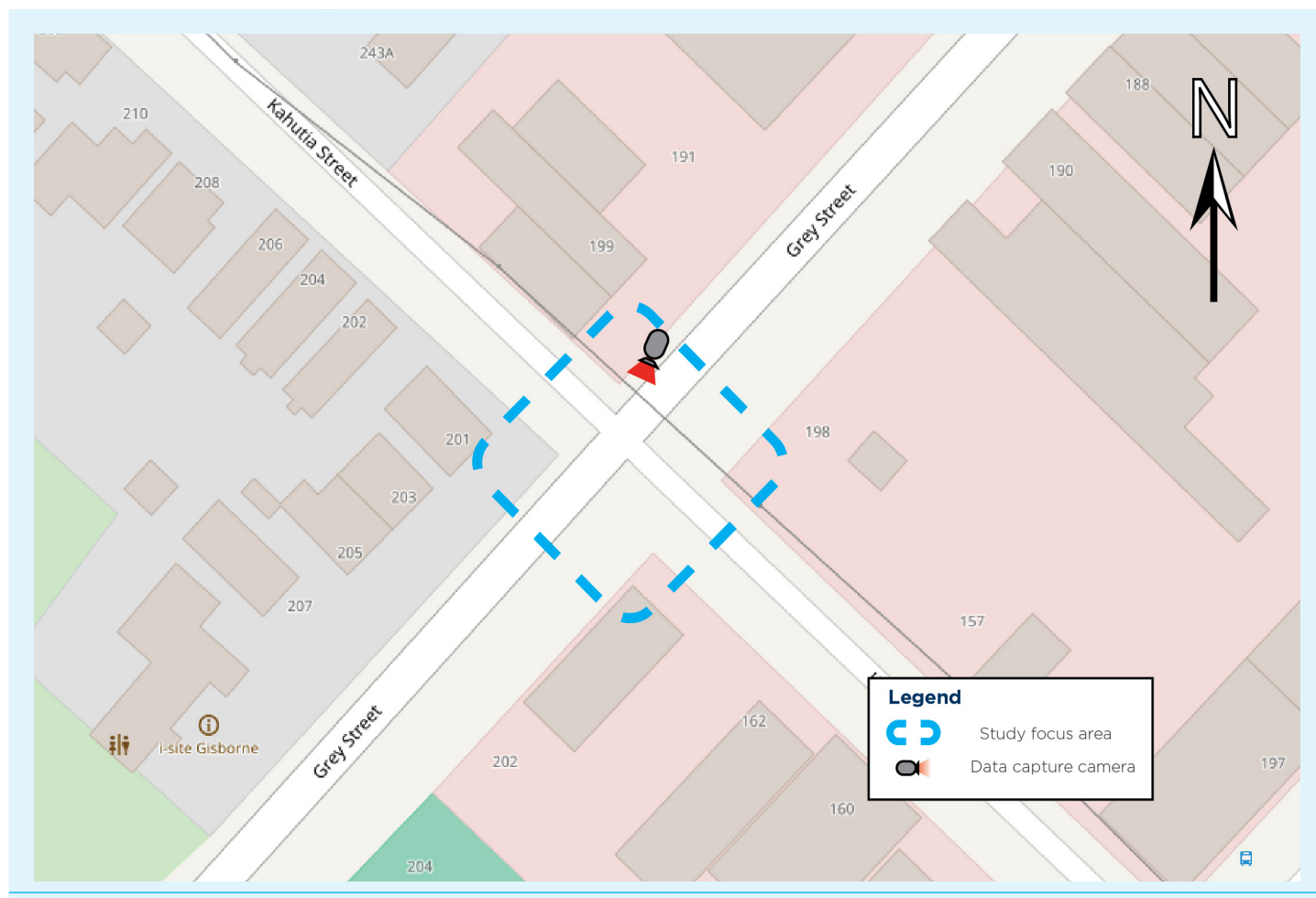
A car park occupancy analysis was carried out at Childers Rd to understand the occupancy percentage and turnover of the realigned car spaces on Grey St.

A conflict analysis of the pedestrian crossing was also conducted to identify any near-miss incidents between users and any other behaviour or patterns that could be risky.

*Note on supplied footage

The dates and times of the footage supplied to Bicycle Network were incorrect and the data has been adjusted to reflect the correct times.

Survey Site 1: Kahutia St & Grey St



Location:

Kahutia Street and Grey Street, Gisborne, New Zealand, 4010

Coordinates:

-38.667175, 178.021097

Dates and Time:

Friday 23rd August to Sunday 25th August
7:00am to 6:00pm each day*

Weather conditions:

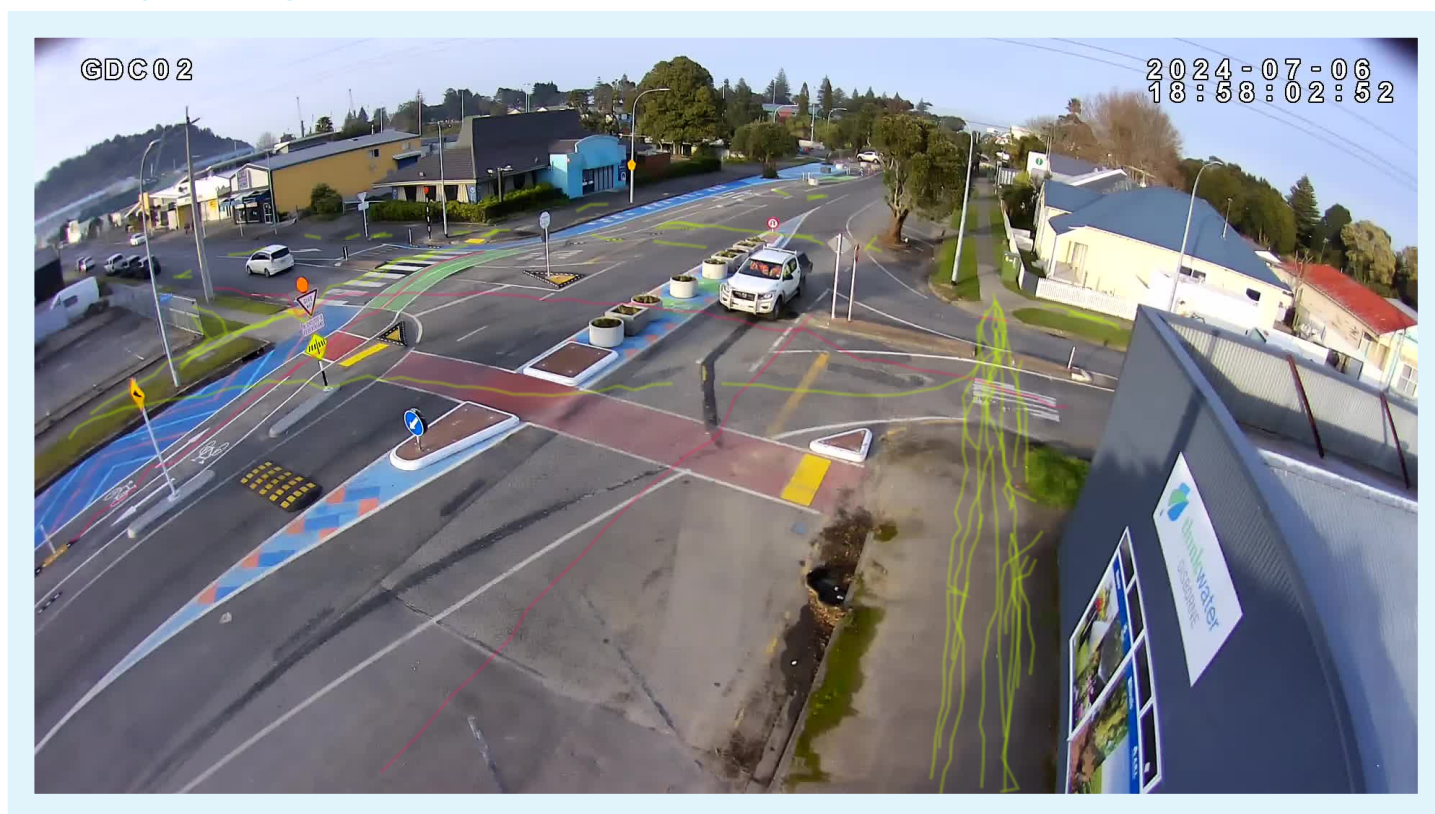
Max temp: 19 °C
Min temp 2.9 °C
Total rainfall: 0 mm (across 3 survey days):

Survey Site Aims:

- To determine volumes and movements of users (riders, pedestrians and vehicles) and what path type (cycleway, road, footpath) they are travelling on.
- To investigate and analyse potential conflicts between vehicles and vulnerable road users (bike riders and pedestrians), or between riders and pedestrians on paths.

Active Traveller Movement Tracelines

Weekday Morning - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 8:00am - 9:00am on Friday 23rd August, 2024.

Weekday Afternoon - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 3:00pm - 4:00pm on Friday 23rd August, 2024.

Active Traveller Movement Tracelines

Weekend Morning - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 10:00am - 11:00am on Saturday 24th August, 2024.

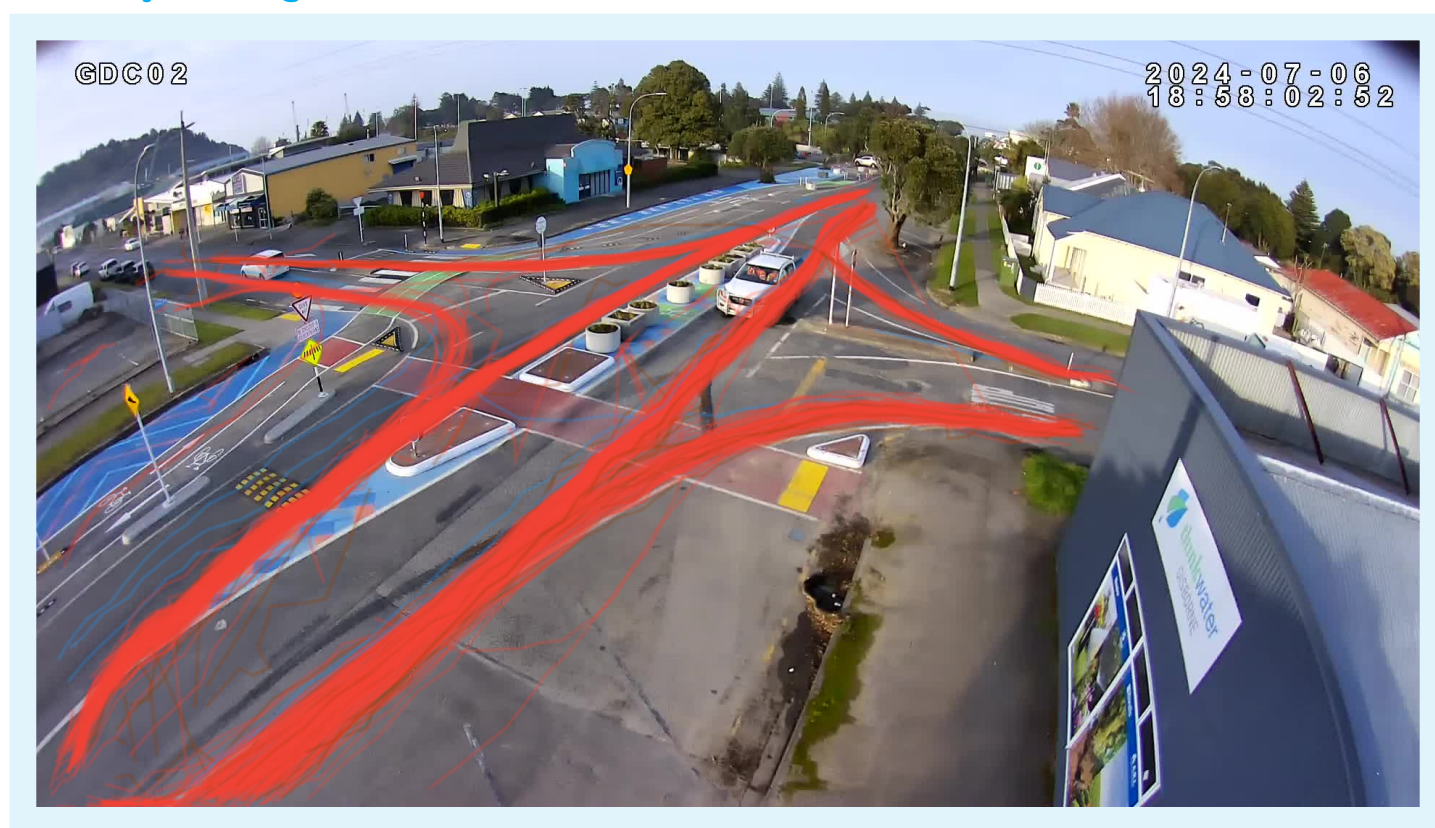
Weekend Afternoon - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 3:00pm - 4:00pm on Saturday 24th August, 2024.

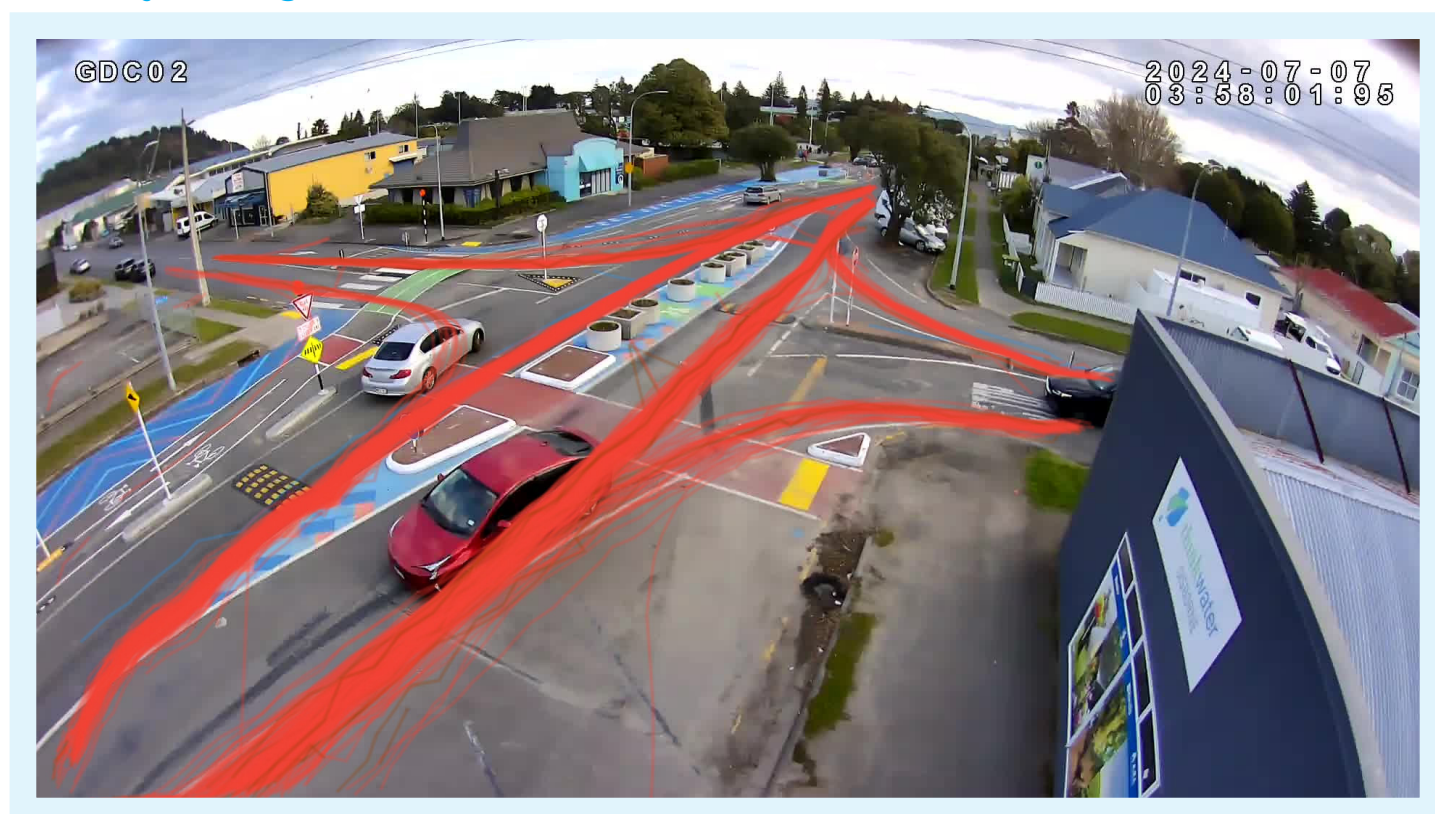
Vehicle Movement Tracelines

Weekday Morning - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 8:00am - 9:00am on Friday 23rd August 2024.

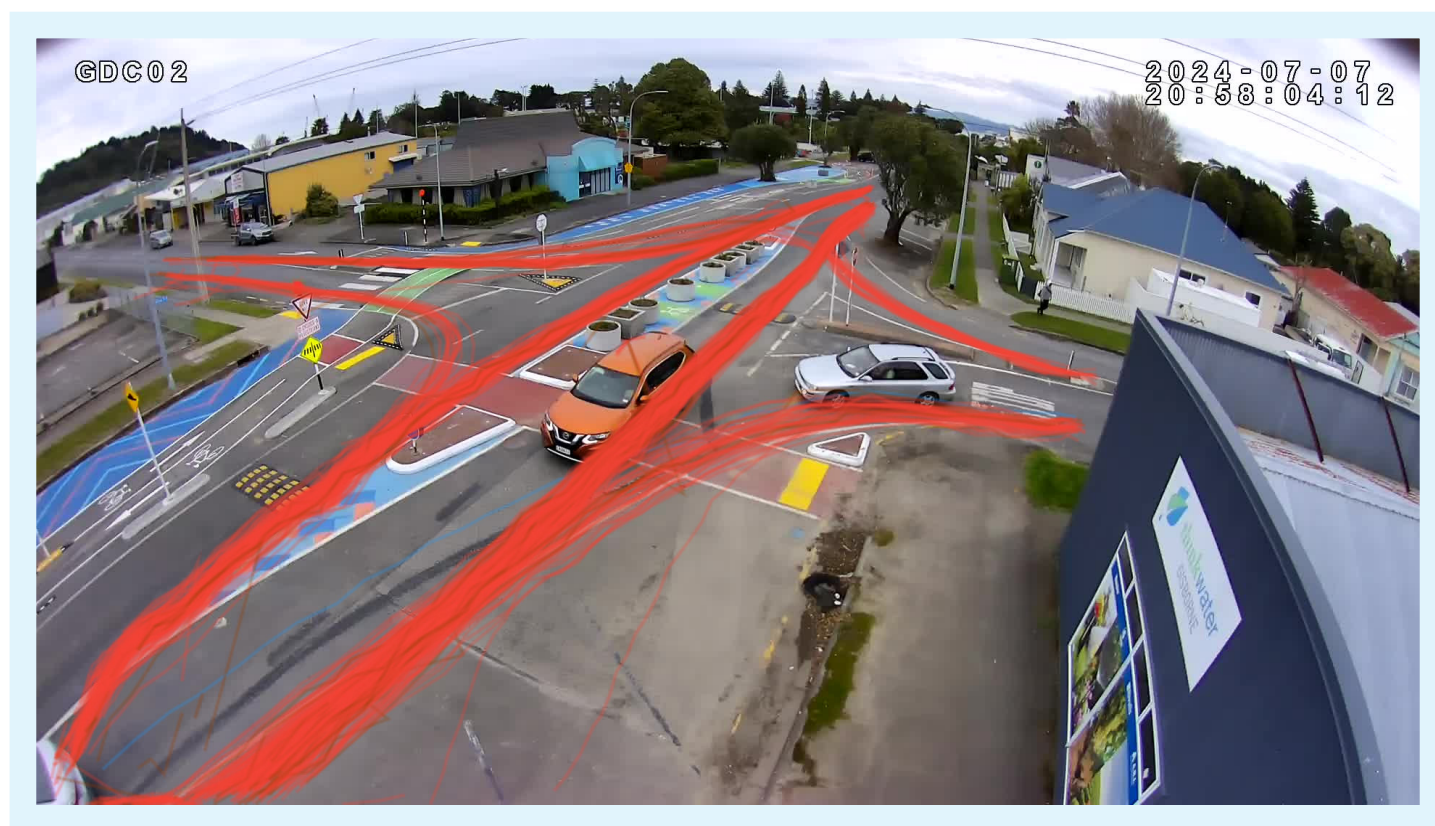
Weekday Evening - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 5:00pm - 6:00pm on Friday 23rd August 2024.

Vehicle Movement Tracelines

Weekend - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 10:00am - 11:00am on Saturday 24th August, 2024.

Weekday Morning - Large Vehicle Movement Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 8:00am - 9:00am on Friday 23rd August 2024.

Vehicle Movement Tracelines

Weekday Evening - Large Vehicle Movement Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 5:00pm - 6:00pm on Friday 23rd August 2024.

Weekend - Large Vehicle Movements - Traceline Paths



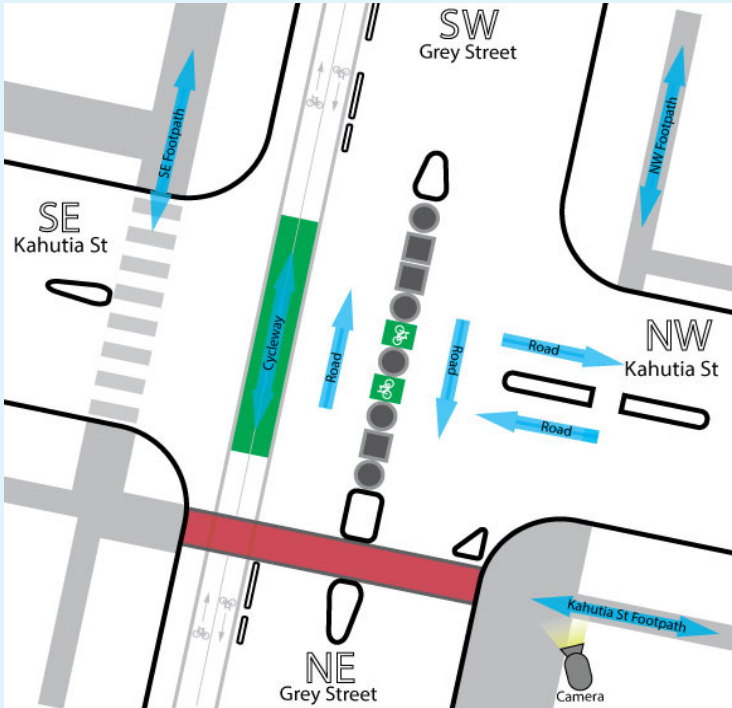
Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 10:00am - 11:00am on Saturday 24th August, 2024.

Rider Volumes and Movements

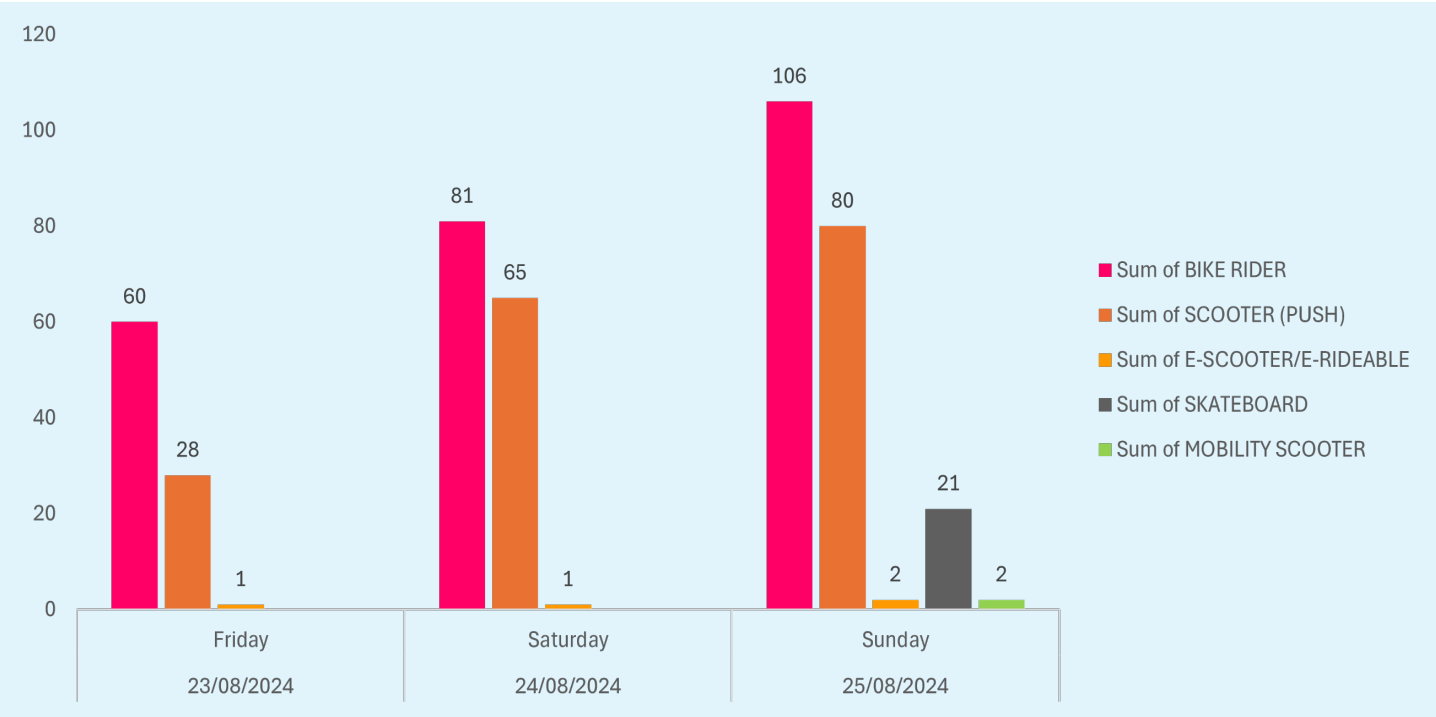
Rider Data Collection Methodology

To extract data from the AI Software, we have placed digital ‘count lines’ over the footage. The AI Software automatically detects and classifies the type of user and counts them if they pass over the lines. At times, a manual analysis was required due to the AIRS software not detecting riders accurately.

Each path type is displayed in the graphic below by the blue arrows. Each rider was counted once as they passed through the site. The volumes are contained in the graphs on the following pages.



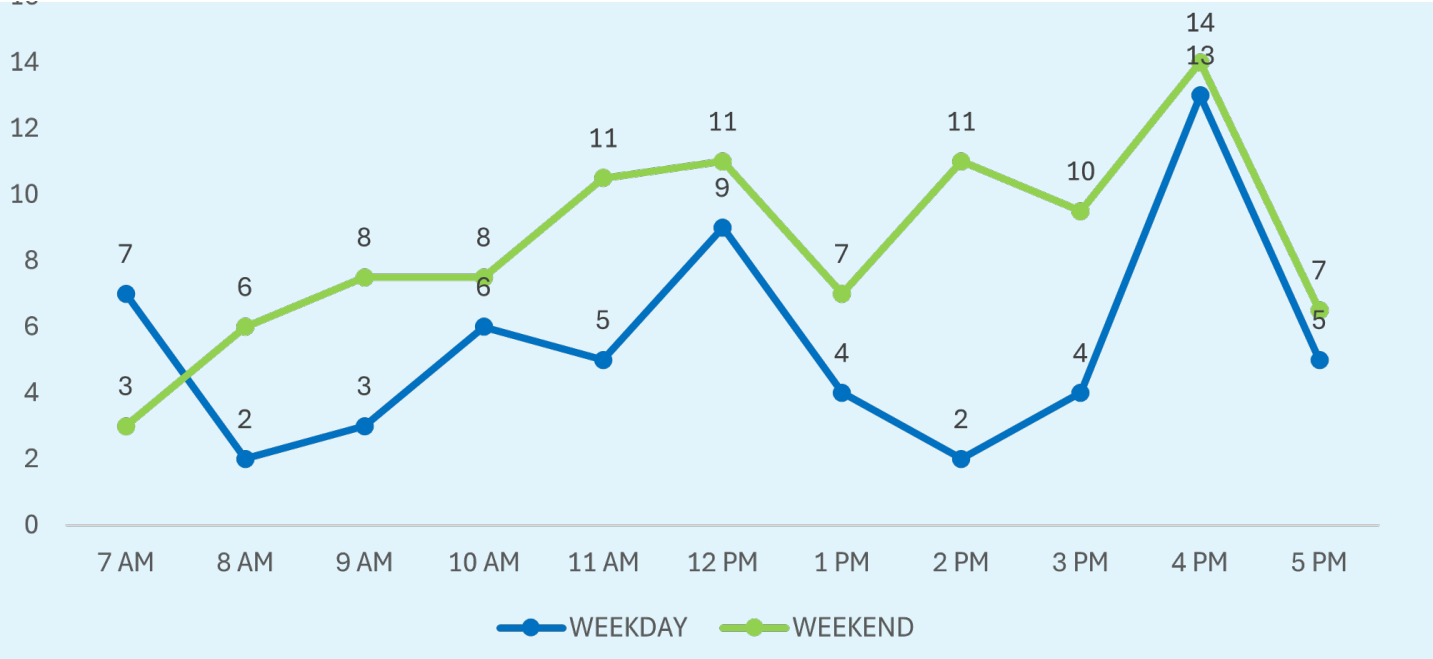
Total Daily Volumes of Riders - All Movements



Total volume of riders travelling through the Grey St/Kahutia St intersection for each survey day (7:00am - 5:00pm), categorised by user-type.

Rider Volumes and Movements

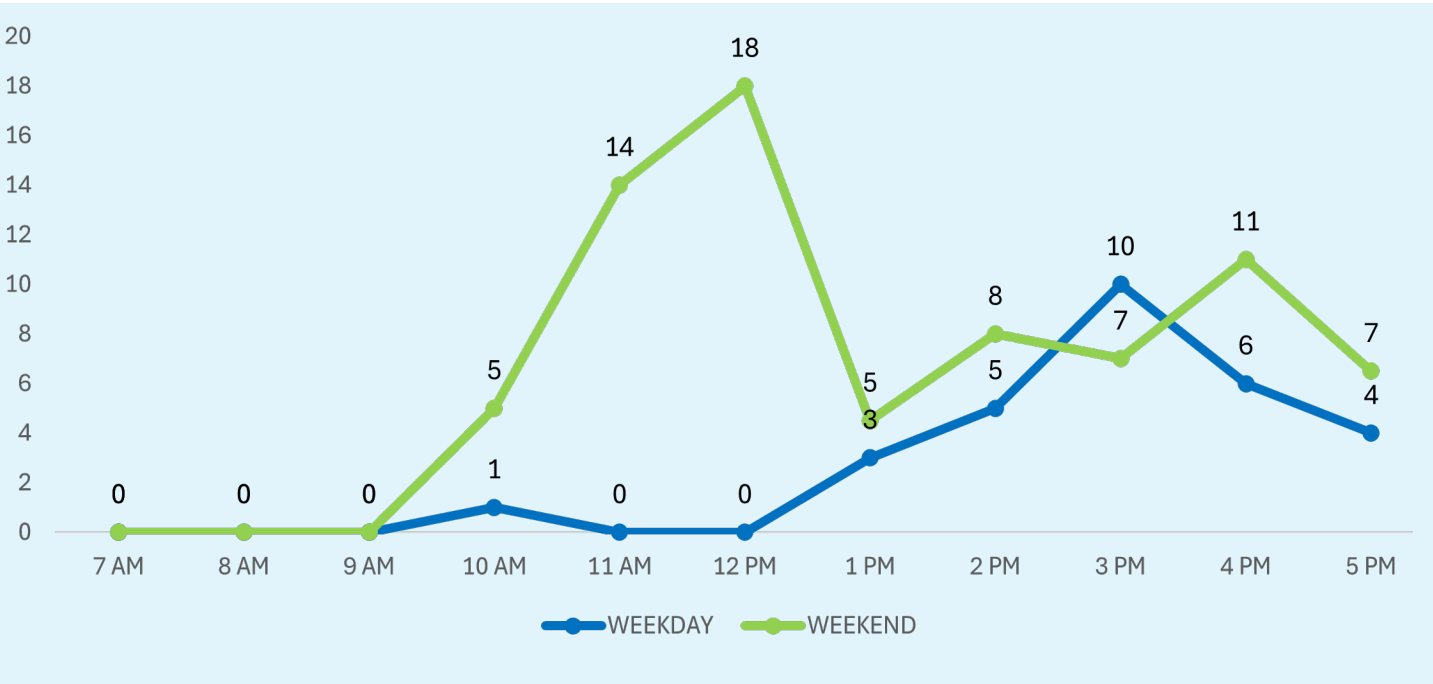
Hourly Bike Rider Volumes



Hourly volumes of bike riders during the survey period on a weekday (Friday 23rd August), compared to an average weekend day (average of the 2 weekend days studied).

- The weekday has three main peaks of bike riders:
 - The first peak from 7:00am - 8:00am (7 riders an hour).
 - A second peak from 12:00pm - 1:00pm (9 riders an hour).
 - A third (and the largest) peak from 4:00pm - 5:00pm (13 riders an hour).
- On weekend days, bike rider volumes peak from 4:00pm - 5:00pm

Hourly Scooter (Push and E-Scooter) Volumes

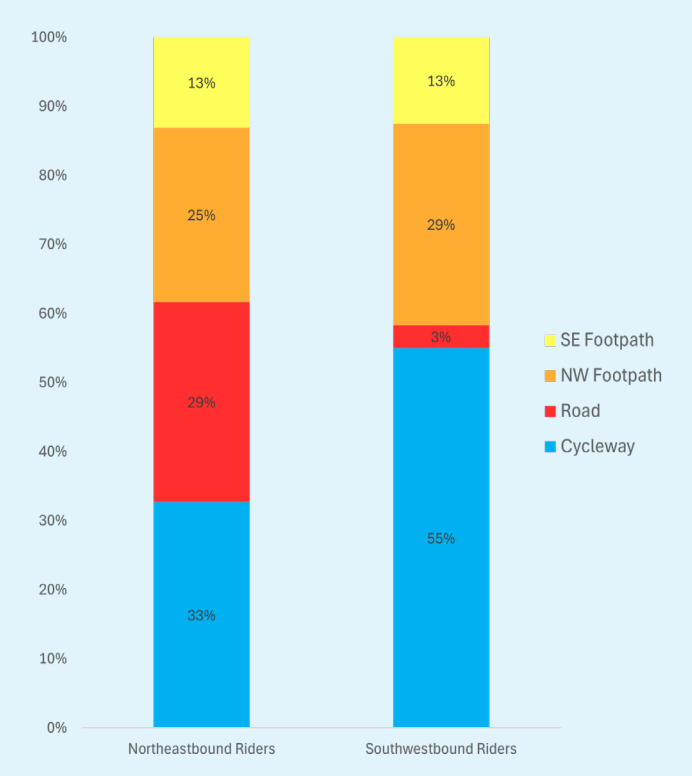


Hourly volumes of scooter (push) riders during the survey period on a weekday (Friday 23rd August), compared to an average weekend day (average of the 2 weekend days studied).

- Weekdays have a uni-modal peak of bike riders from 3:00pm - 4:00pm, which coincides with school finishing.
- On weekend days, scooter rider volumes peak from 12:00pm - 1:00pm (18 riders).

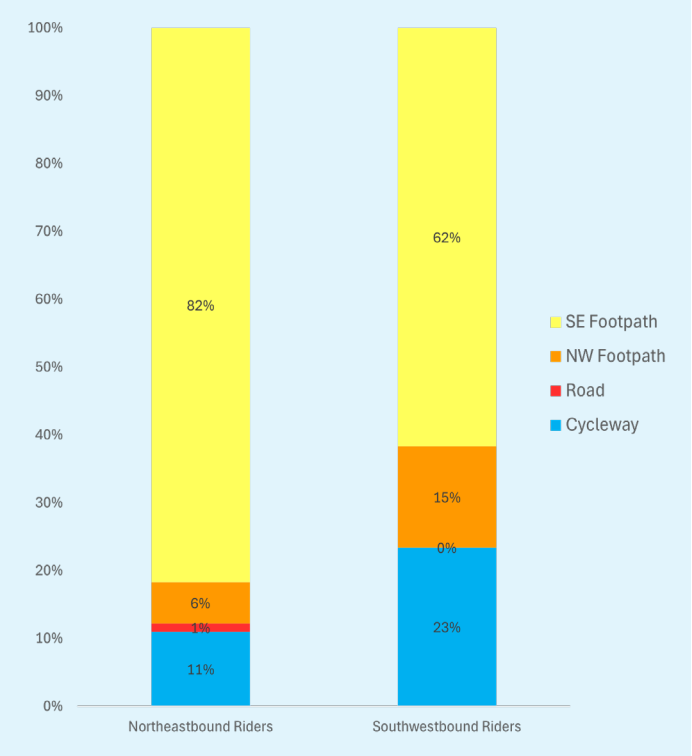
Rider Volumes and Movements

Grey St Bike Rider Path-Type by Direction



The percentage of northeastbound bike riders using each path type on Grey Street compared to the percentage of southwestbound riders (towards the skatepark) using each path type.

Grey St Bike Rider Path-Type by Direction



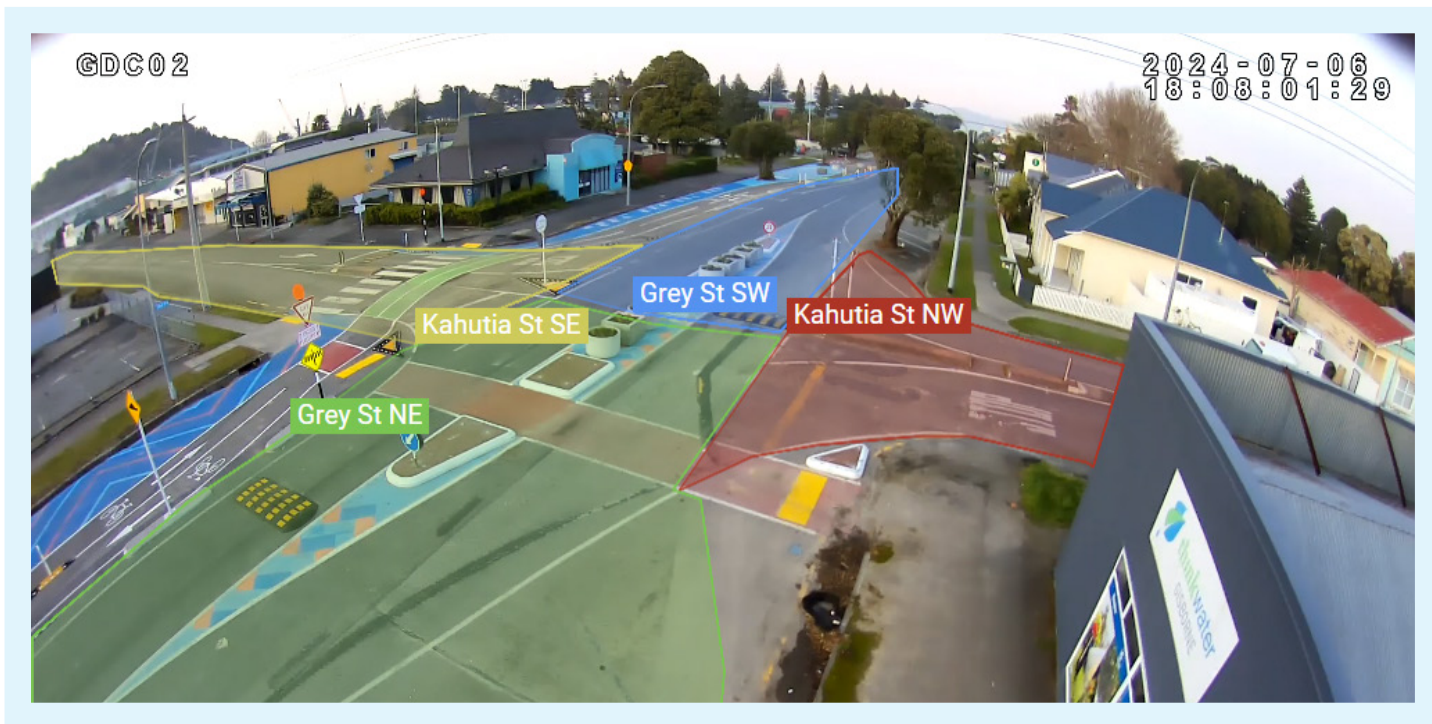
The percentage of northeastbound scooter riders using each path type on Grey Street compared to the percentage of southwestbound riders (towards the skatepark) using each path type.

- A significantly greater proportion of southwestbound riders use the cycleway (55%) compared to northeastbound riders (33%).
 - This difference could be reflected by the bidirectional cycleway being on the “correct” (left) side for southwestbound riders, but on the “wrong” (right) side for northeastriders.
- A significantly greater proportion of northeastbound riders use the road (29%) compared to northbound riders (3%).
 - Again, this difference could possibly be attributed to the absence of a cycleway on the left of the road for southbound riders, meaning riders need to cross traffic on the road to get to the bidirectional cycleway.
- The volume of bike riders on the footpath is similar for both directions of travel. This high percentage of riders on the footpath is likely partly due to the nearby skate park and associated high proportion of children.
- A greater proportion of southwestbound scooter riders use the cycleway (23%) compared to northeastbound riders (11%).
- The majority of scooters rode on the southeast footpath (71%), which is the footpath on the side of the skate park.
- Only one scooter was recorded riding on the road. This was an e-scooter.

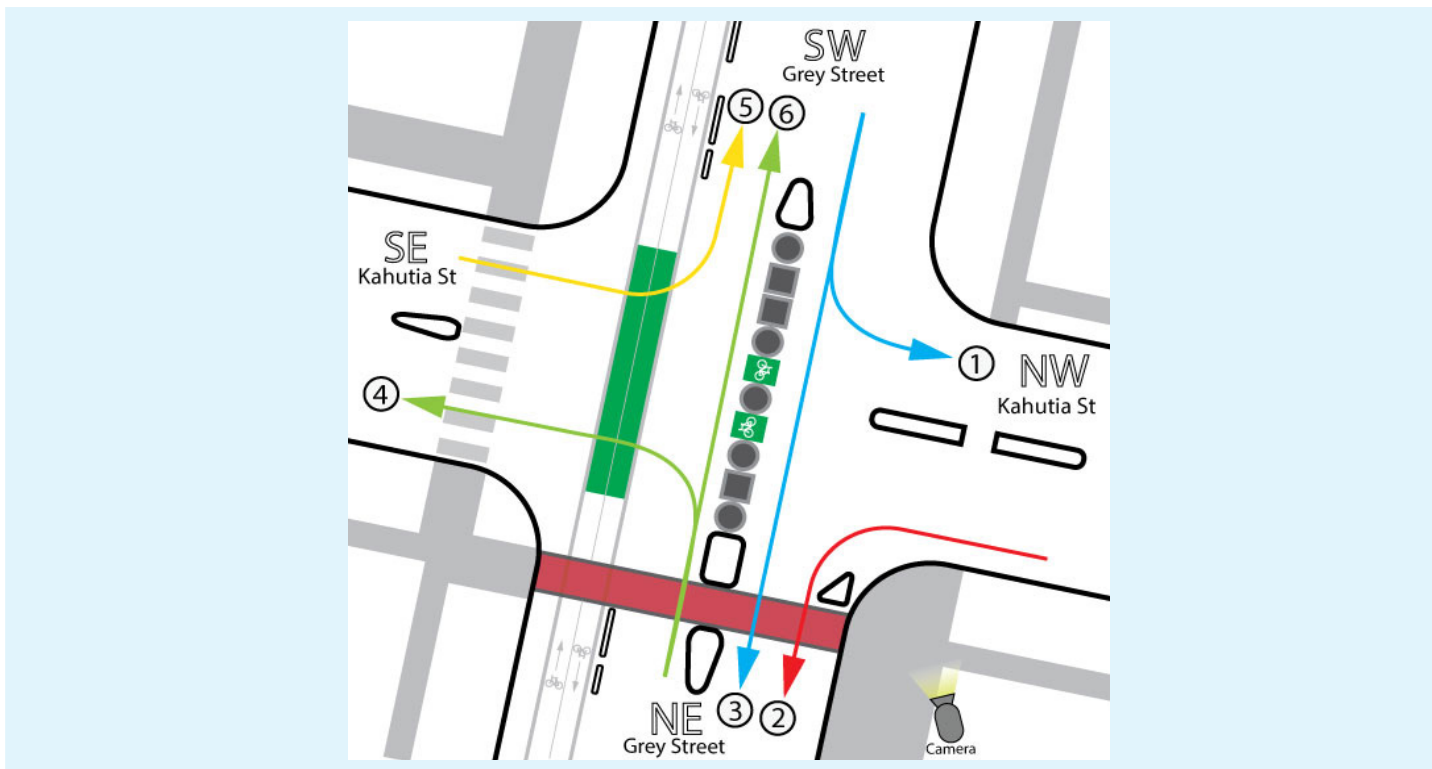
Motor Vehicle Volumes and Movements

Motor Vehicle Data Collection Methodology

To extract data from the AI Software, we have placed digital 'count shapes' over the footage. The AI Software automatically detects and classifies the type of user and counts them if they pass between two shapes. This allows us to study all possible movements by all user types.



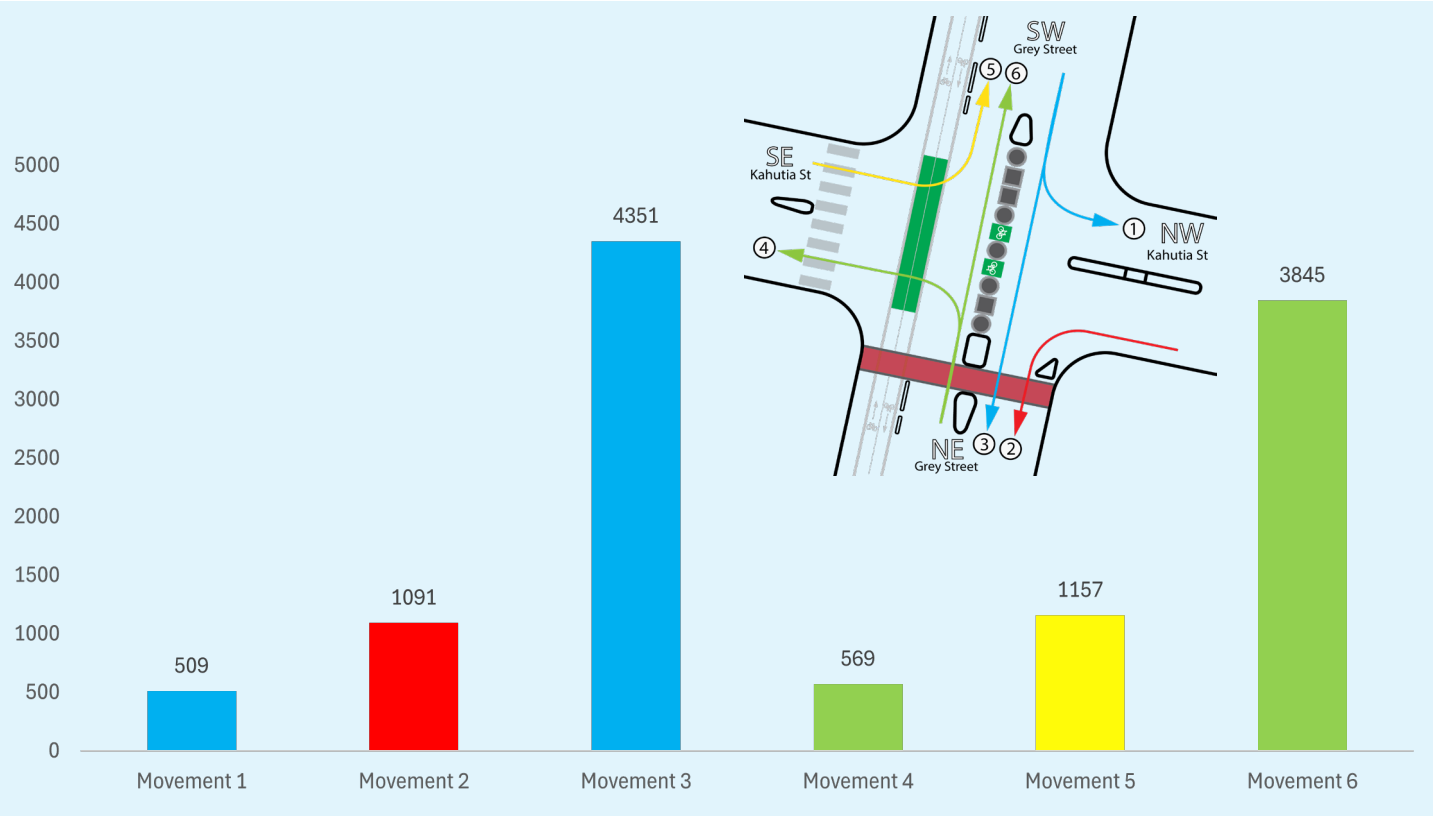
Above is a screenshot of how these count shapes have been created in the AI Software to extract the relevant data. Each movement studied has a Movement Label.



Each possible movement (movements between Movement Labels) has been translated into a 'Movement ID' and is displayed as a number in the graphic above. The Movement IDs relate to the road user volumes contained in the data graphs on the following page.

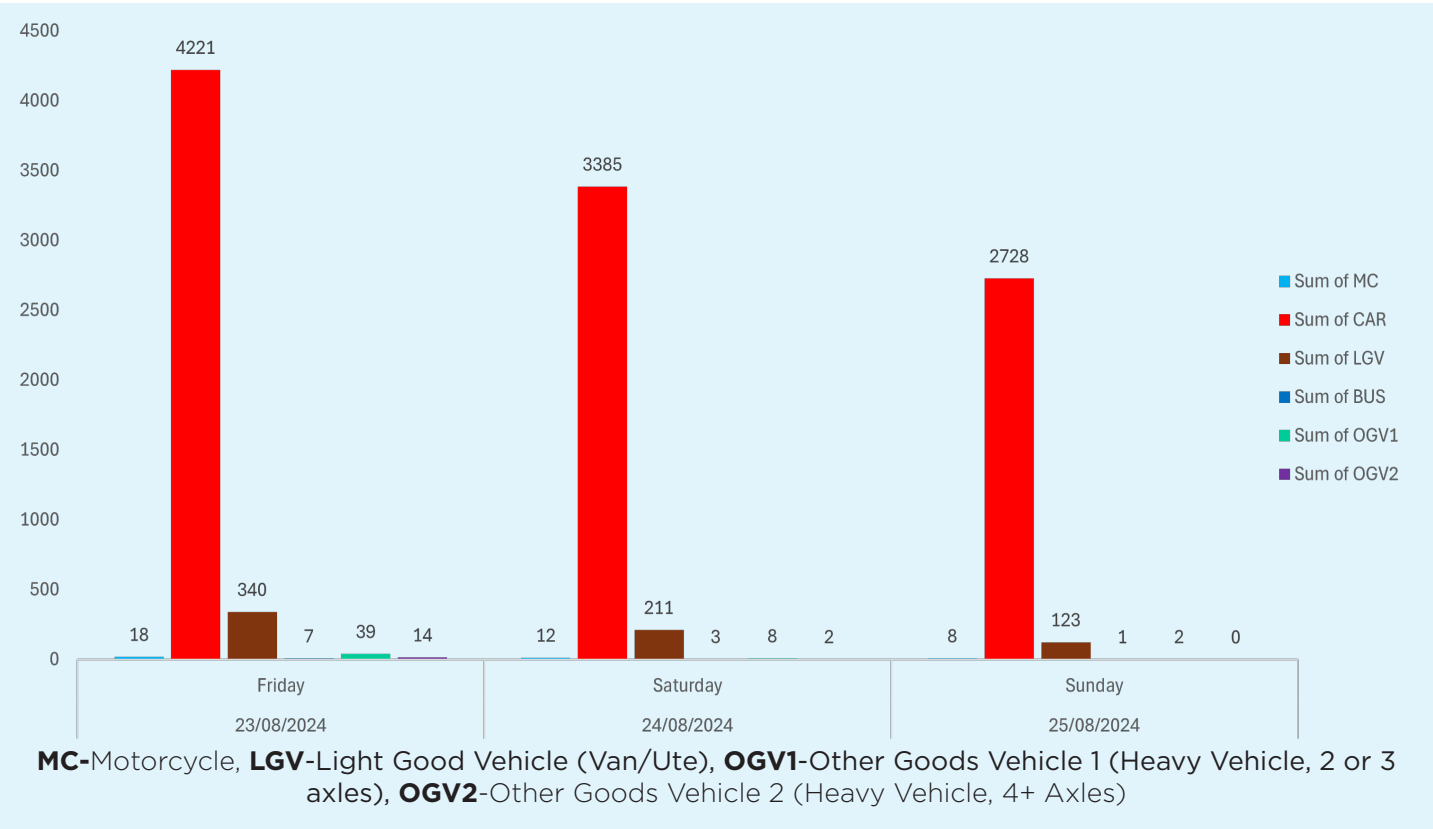
Motor Vehicle Volumes and Movements

Total Volumes of Motor Vehicles by Movement ID - Entire Survey Period



Total volume of motor vehicles passing through the Grey St and Kahutia St Intersection for all three survey days (7:00am - 5:00pm), categorised by movement ID.

Daily Volumes of Motor Vehicles by User Type

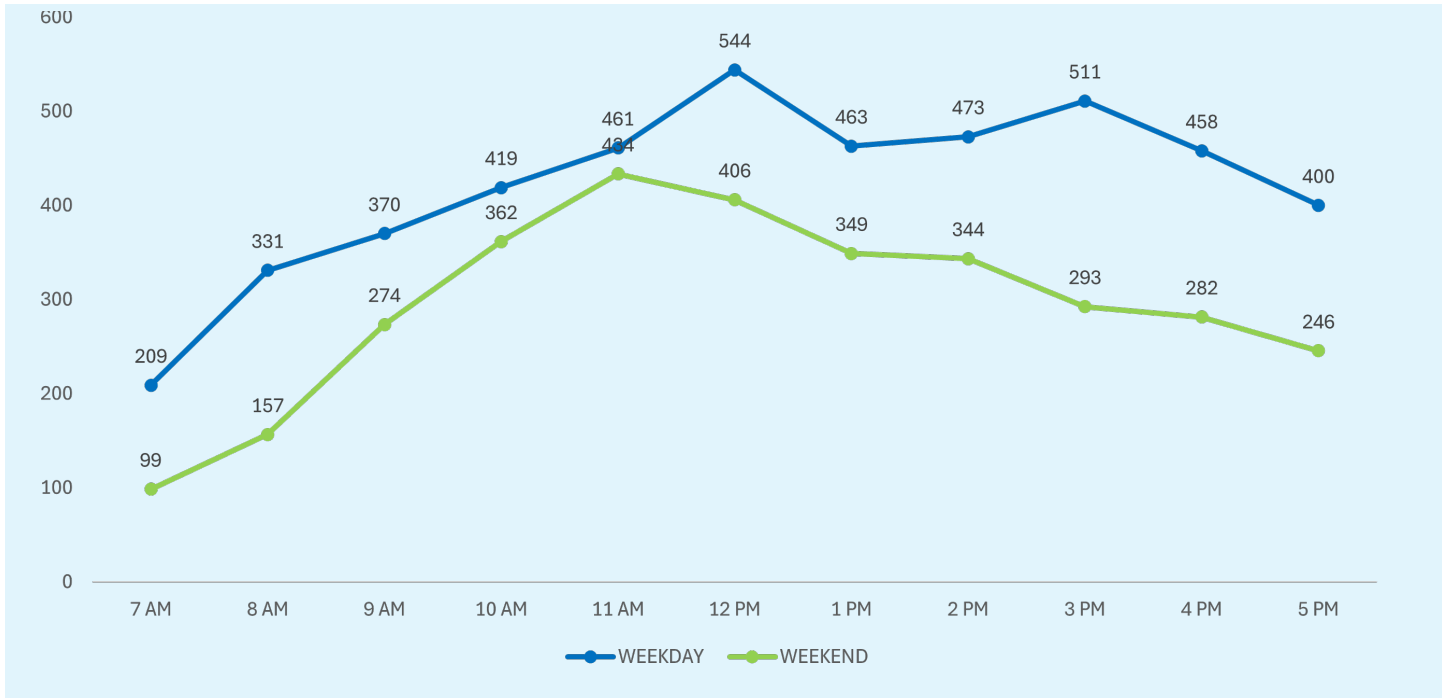


Total volume of motor vehicles passing through the Grey St and Kahutia St Intersection each survey day (7:00am - 5:00pm), categorised by user type.

*For greater detail of the data table, please open the accompanying Excel Worksheet.

Motor Vehicle Volumes and Movements

Hourly Motor Vehicle Volumes



Average hourly volumes of motor vehicles passing through the Grey St and Kahutia St Intersection on a weekday compared to a weekend day. Weekday volumes are from Friday 23rd August and weekend volumes an average of the 2 weekend days studied.

Illegal Manoeuvres - Motor Vehicles

Background

The Kahutia Street/Grey Street intersection is left-hand turn only. Concrete planter boxes have been used to prevent through-traffic on Kahutia Street and right-hand turns. Despite the “no U-turn” and “no right-hand turn” signs, some motor vehicles still complete these movements.

Methodology

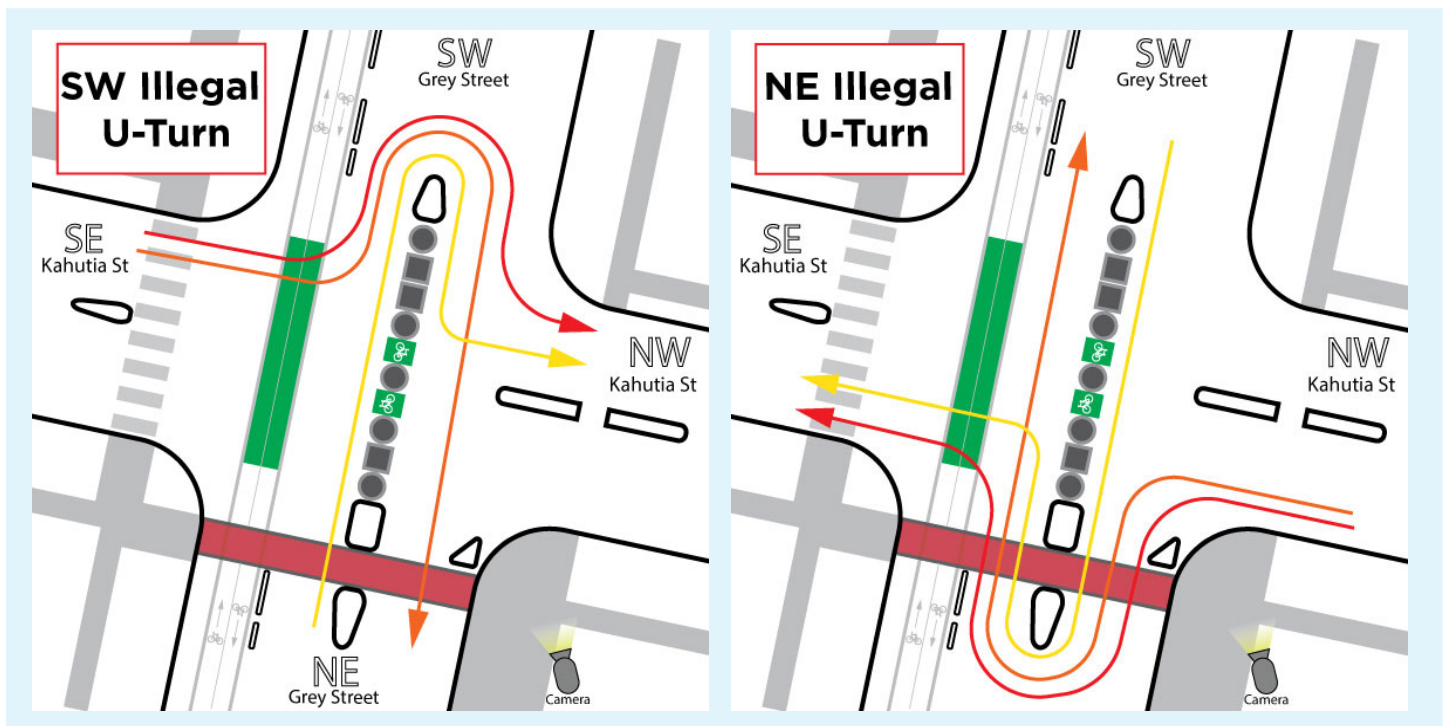
Video footage from each survey day was watched by Bicycle Network and each illegal manoeuvre manually counted. This data was used to create the graphs on the following pages.

Motor-vehicle “illegal manoeuvres” were classified into three main categories;

- **U-turns:**
 - Southwest side.
 - Northeast side.
- **Right-hand turns** (which involve the vehicle driving on the wrong (right-hand) side of the road to complete the turn).
- **Motor vehicles in the cycleway.** Some instances of this were due to driver confusion of the new street layout, and others a result of completing a U-turn and not having enough road space to complete the turn (so would enter cycleway).

U-Turn Movements

The side of the U-turn (either southwest or northeast) was recorded for each occurrence. The graphics below show the movement paths of these two classifications of U-turn.



Illegal U-turn movements.

Illegal Manouevres - Motor Vehicles

Right-Turn Movements

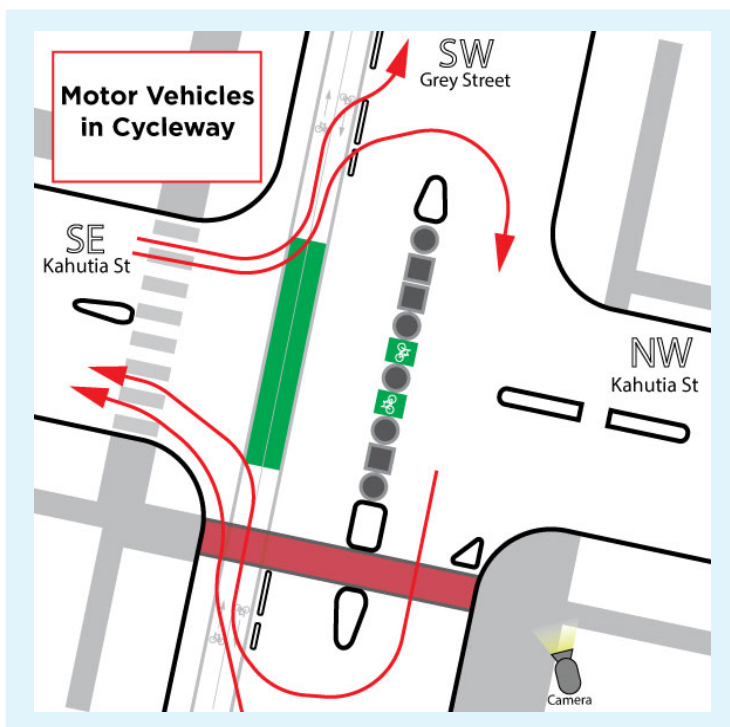
The graphic below shows the movement paths of illegal right-hand turns recorded.



Illegal right-hand turn movements.

Motor Vehicles Travelling in the Cycleway Movements

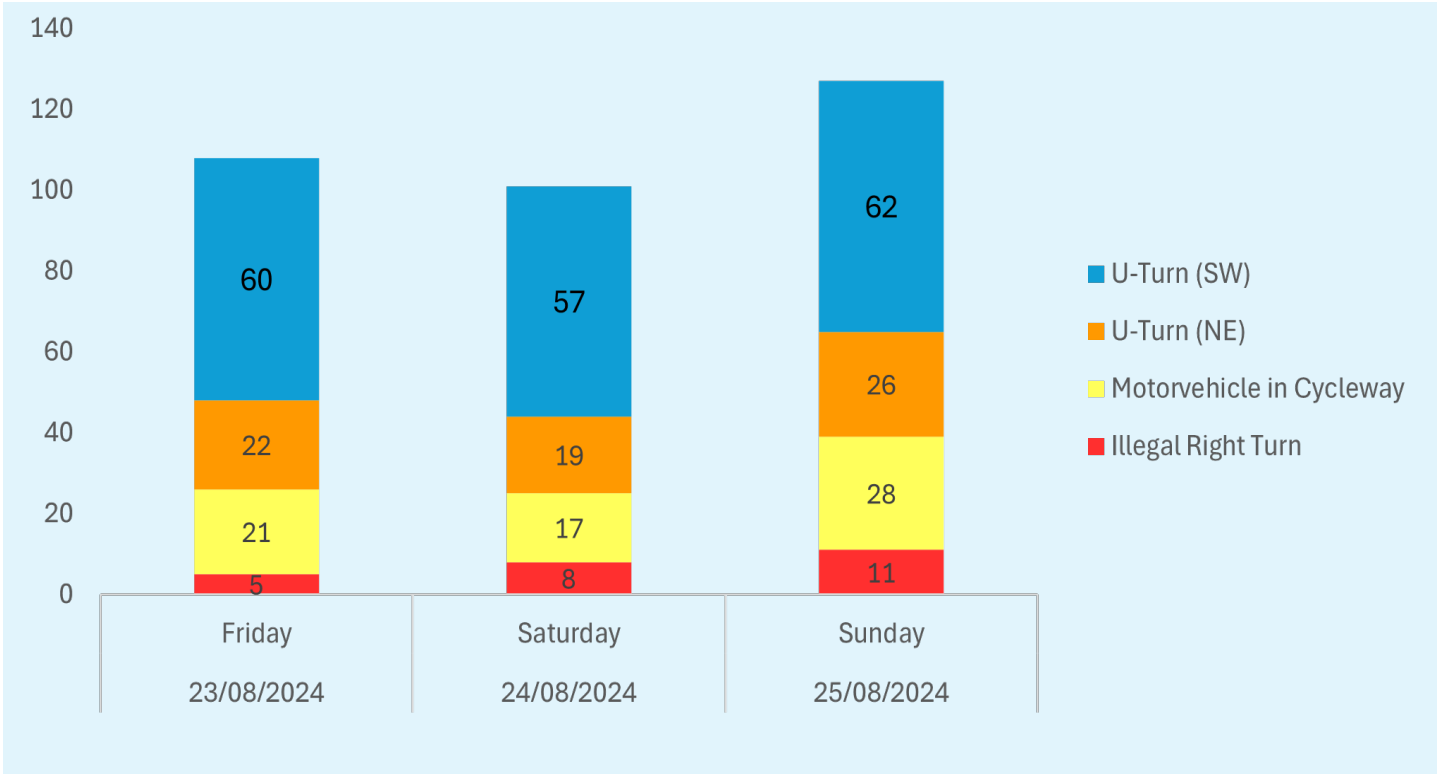
The graphic below shows the movement paths of motor vehicles travelling in the cycleway.



Example movements of motor vehicles driving in the cycleway.

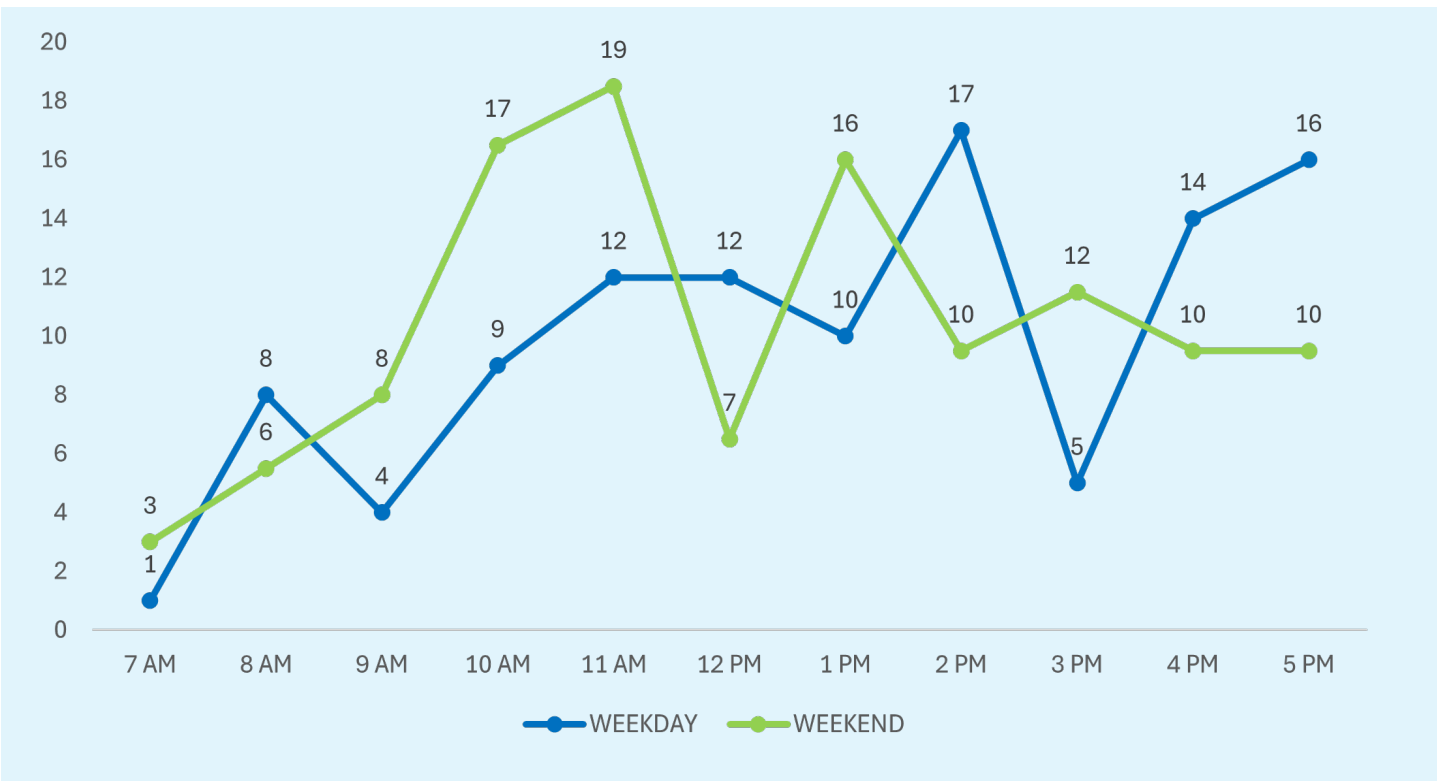
Illegal Manouvres - Motor Vehicles

Total Daily Volumes of Illegal Motor Vehicle Movements



Total volume of motor vehicles completing an illegal movement while travelling through the Grey St/Kahutia St intersection for each survey day (7:00am - 5:00pm), categorised by movement type. Note that some vehicles were counted twice, completing a U-turn and travelling in the cycleway.

Hourly Volume of Illegal Motor Vehicle Movements



Average hourly volumes of motor vehicles completing illegal movements, passing through the Grey St and Kahutia St Intersection on a weekday compared to a weekend day. Weekday volumes are from Friday 23rd August and weekend volumes an average of the 2 weekend days studied.

Illegal Manoeuvres and Events of Interest

Examples of illegal manoeuvres performed by drivers, or other events of interest were clipped as videos and can be found in the “Video Clips” File along with this report. These videos are described in the table below. Note that these video clips are just a sample and do not include each occurrence of an illegal manoeuvre.

Table 1. Illegal manoeuvre examples and events of interest.

Date	Time	Description of Event	Video Clip ID
Friday, 23 August 2024	3:46:00 PM	Driver of LGV turns left into cycleway and completes U-turn at southwest end.	1
Friday, 23 August 2024	9:49:30 AM	Driver of LGV completes U-turn at northwest end and enters cycleway.	2
Friday, 23 August 2024	8:32:00 AM	Driver turns right from Kahutia St onto Grey St.	3
Friday, 23 August 2024	10:53:05 AM	Driver turns right from Grey St onto Kahutia St.	4
Friday, 23 August 2024	11:35:35 AM	LGV driver drives in cycleway and parks on blue paint next to the cycleway. LGV then mounts the footpath, drives in the cycleway again and drives on the wrong (right-hand) side of the road.	5&6
Friday, 23 August 2024	12:21:50 PM	Driver completes U-turn at northwest end and enters cycleway.	7
Friday, 23 August 2024	3:05:25 PM	Driver turns right from Kahutia St onto Grey St and meets oncoming traffic. Oncoming car must manoeuvre around car which completed the illegal right-hand turn.	8
Friday, 23 August 2024	4:19:42 PM	Driver turns right from Grey St onto Kahutia St.	9
Friday, 23 August 2024	4:47:40 AM	Driver fails to give way to two northwestbound children scooter riders in the cycleway.	10
Friday, 23 August 2024	4:50:30 AM	Two LGV drivers consecutively complete a U-turn at the northwest end. One enters the cycleway.	11
Friday, 23 August 2024	1:55:30 PM	Driver of OGV1 turns right from Grey St onto Kahutia St.	12
Saturday, 24 August 2024	8:22:50 AM	Driver turns right from Kahutia St onto Grey St.	13
Saturday, 24 August 2024	8:41:05 AM	Driver turns left from Kahutia St into cycleway, appearing confused before returning to correct road lane.	14
Saturday, 24 August 2024	11:28:30 AM	Driver turns right from Kahutia St onto Grey St before merging into correct lane.	15
Saturday, 24 August 2024	12:09:33 PM	Pair of pedestrians cross Grey St in the middle of the intersection (not using the designated crossing) and hold up a car which gives-way.	16
Saturday, 24 August 2024	1:54:10 PM	Driver turns left from Kahutia St onto blue painted area between the cycleway and footpath. The driver appears confused and reverses out of area before doing U-turn in front of another car (other car slows down to give way). Driver then slows down to incorrectly give-way to another vehicle in the intersection, even though they had right-of-way.	17
Saturday, 24 August 2024	2:15:40 PM	Driver turns right onto Kahutia St from Grey St.	18
Saturday, 24 August 2024	3:05:40 PM	Driver turns right onto cycleway from Kahutia St and drives along cycleway.	19

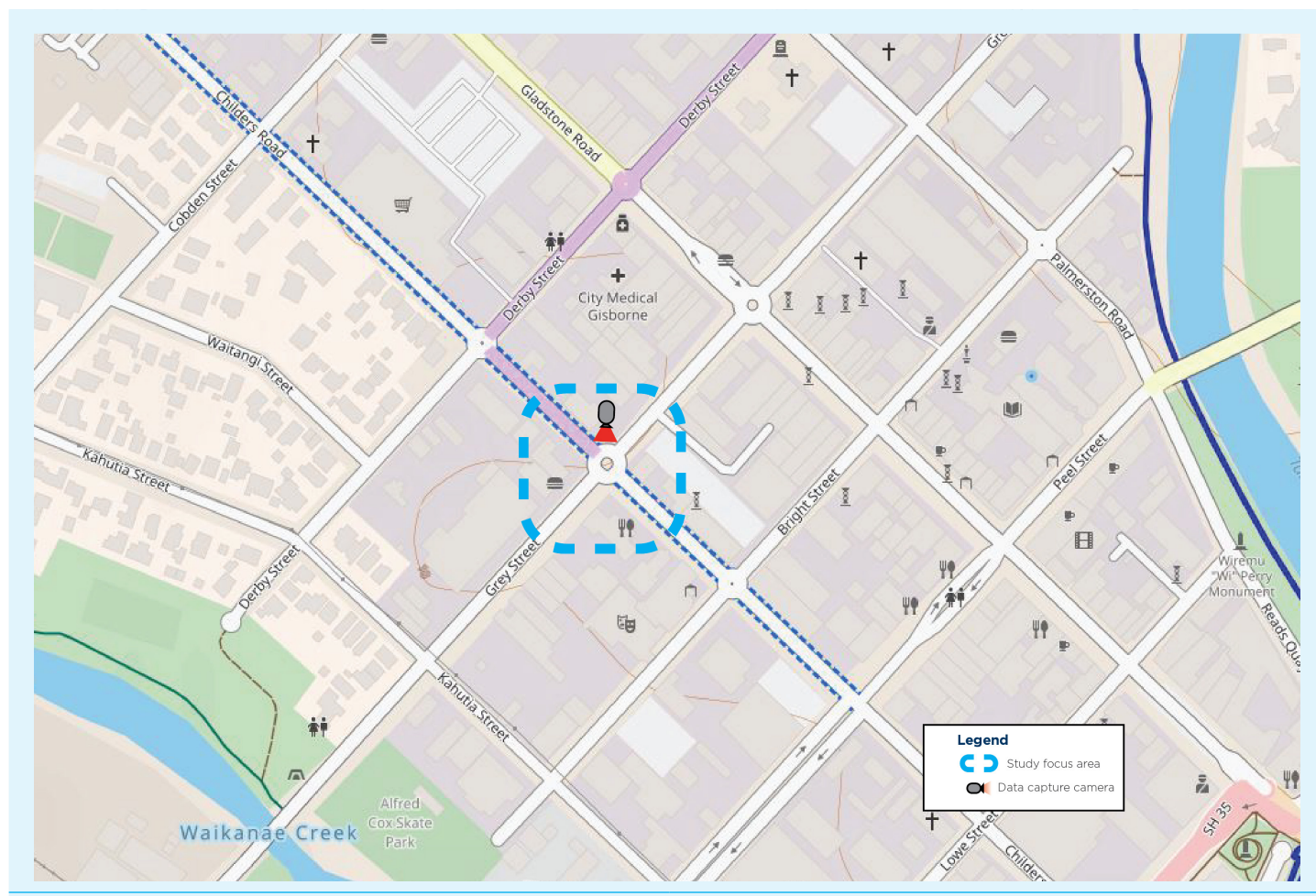
Illegal Manoeuvres and Events of Interest

Date	Time	Description of Event	Video Clip ID
Saturday, 24 August 2024	1:13:15 AM	Driver waits on Kahutia S pedestrian crossing blocking pedestrians while waiting for traffic to clear before turning right onto Grey St.	21
Sunday, 25 August 2024	8:23:50 AM	Driver turns right from Grey St onto Kahutia St at speed.	22
Sunday, 25 August 2024	8:56:20 AM	Northwest bound driver proceeds through intersection on wrong (right-hand) side of road.	23
Sunday, 25 August 2024	9:00:53 AM	Driver turns left from Kahutia St into cycleway and drives along cycleway.	24
Sunday, 25 August 2024	10:17:00 AM	Driver mounts pedestrian crossing island to continue straight along Kahutia St.	25
Sunday, 25 August 2024	11:28:00 AM	Northwest bound driver proceeds through intersection on wrong (right-hand) side of road.	26
Sunday, 25 August 2024	1:59:50 PM	Pedestrian crosses at red crossing point and car does not slow to give-way.	27
Sunday, 25 August 2024	3:15:00 PM	Driver starts to turn left into the cycleway from Kahutia st, but then reverses and correctly drives in road lane.	28

Observations and Findings

- Cars were observed to give-way to pedestrians crossing Grey St at the red-painted crossing more often than not. The only time a car did not stop to give-way was captured in Video Clip 27.
- The intersection did not get congested across the survey period.
- Most vehicles travelled through the intersection slowly, upon observation.
- Some vehicles that performed illegal movements appeared confused by the intersection, however, the majority of illegal movements appeared to be planned and performed with intent.
-

Survey Site 2: Childers Rd & Grey St



Location:

Childers Road and Grey Street, Gisborne, New Zealand, 4010

Coordinates:

-38.665877, 178.022625

Dates and Time:

Friday 23rd August to Friday 30th August

7:00am to 6:00pm each day*

Weather conditions:

Max temp: 19 °C

Min temp 2.9 °C

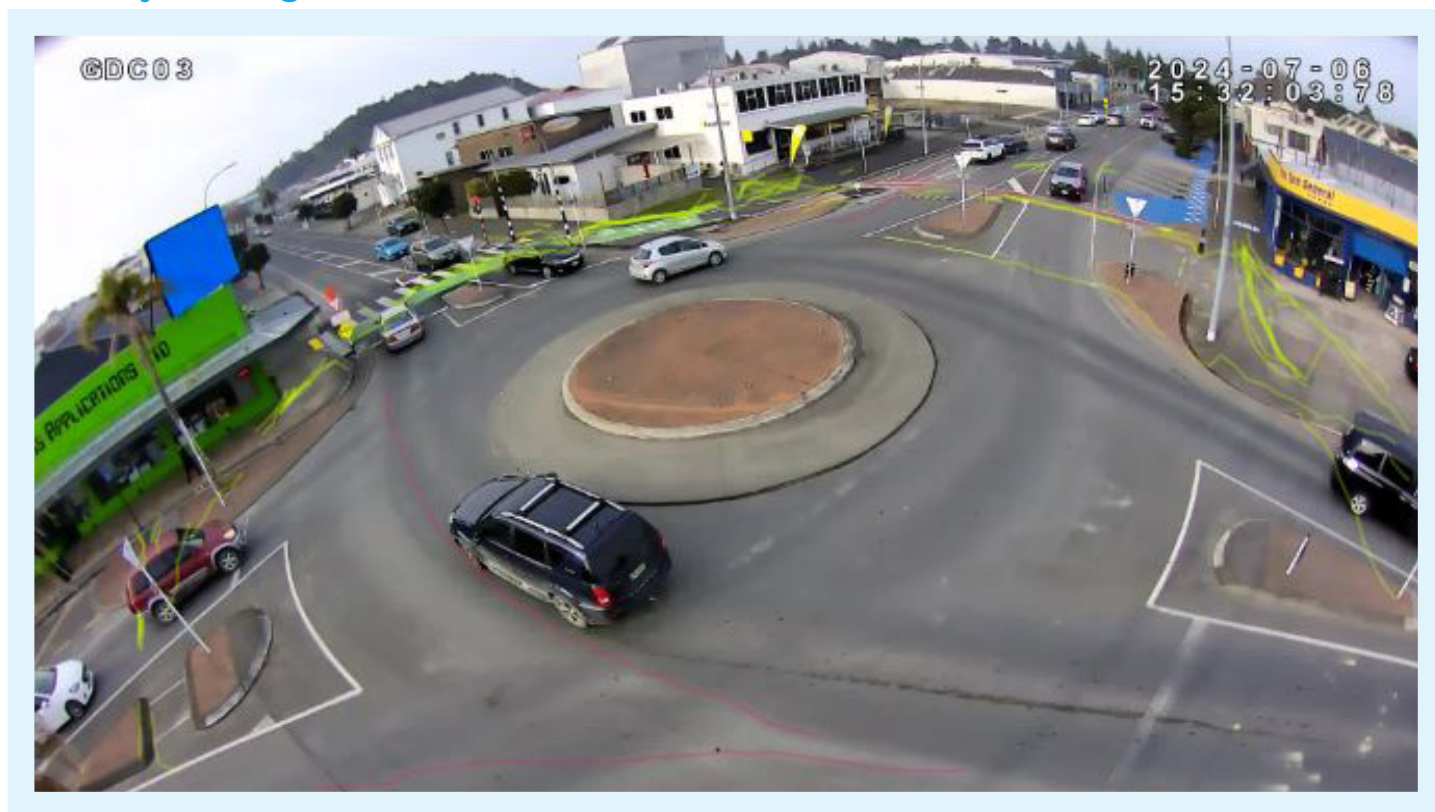
Total rainfall: 12 mm (across 7 survey days):

Survey Site Aims:

- To determine volumes and movements of all road users*
- To analyse car parking occupancy along re-aligned carparking facilities on Grey St.
- *Pedestrian crossing totals were unable to be accurately recorded, likely due to camera vantage point and distance from each crossing.

Active Traveller Movement Tracelines

Weekday Morning - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 8:30am - 9:30am on Friday 23rd August, 2024.

Weekday Afternoon - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 4:30pm - 5:30pm on Friday 23rd August, 2024.

Active Traveller Movement Tracelines

Weekend Morning - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 10:30am - 11:30am on Saturday 24th August, 2024.

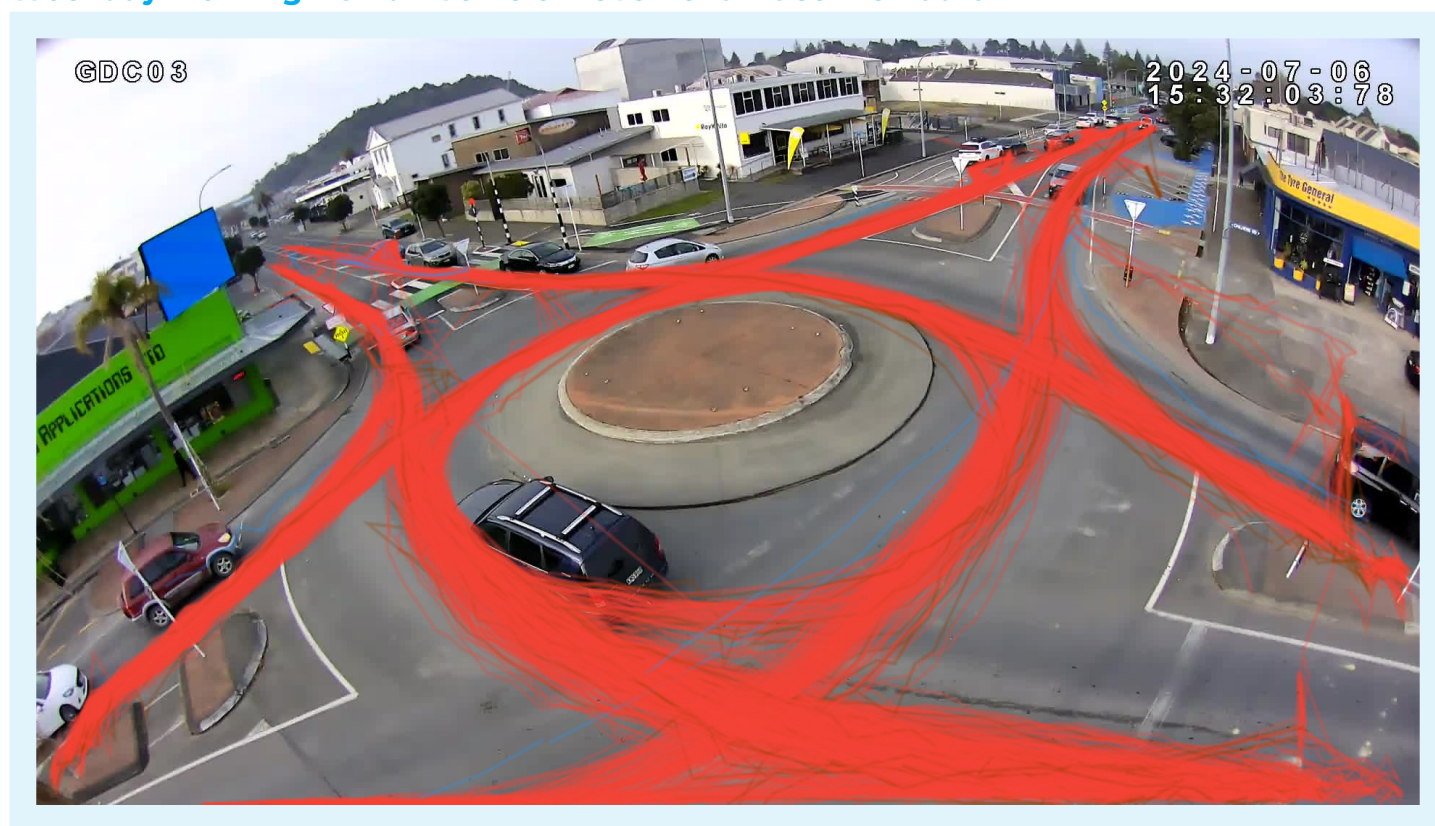
Weekend Afternoon - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 3:30pm - 4:30pm on Saturday 24th August, 2024.

Vehicle Movement Tracelines

Weekday Morning - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 8:30am - 9:30am on Friday 23rd August 2024.

Weekday Evening - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 5:30pm - 6:30pm on Friday 23rd August 2024.

Vehicle Movement Tracelines

Weekend - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 10:30am - 11:30am on Saturday 24th August, 2024.

Weekday Morning - Large Vehicle Movement Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 8:30am - 9:30am on Friday 23rd August 2024.

Vehicle Movement Tracelines

Weekday Evening - Large Vehicle Movement Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 5:30pm - 6:30pm on Friday 23rd August 2024.

Weekend - Large Vehicle Movements - Traceline Paths

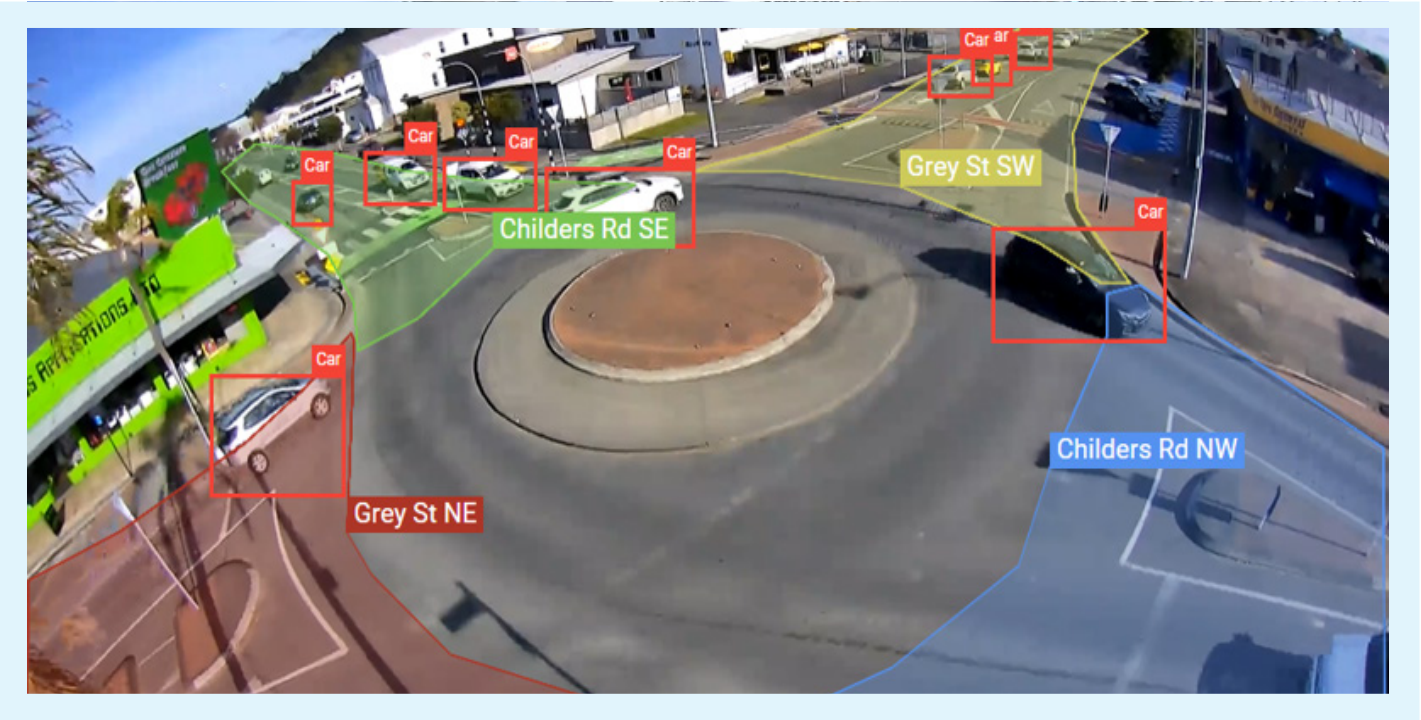


Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 10:00am - 11:00am on Saturday 24th August, 2024.

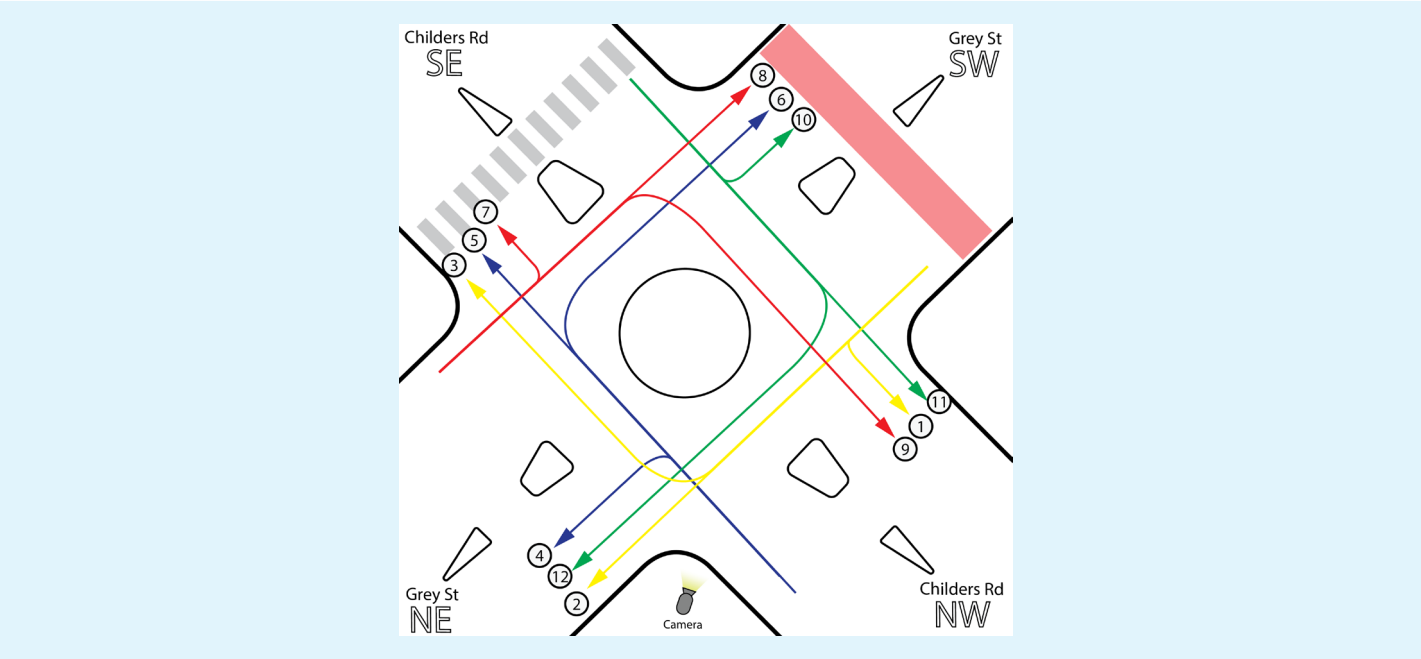
Road User Volumes and Movements

Road User Volumes

To extract data from the AI Software, we have placed digital ‘countlines’ over the footage. The AI Software automatically counts any crossing user that passes through those lines. This allows us to study each movement by road user type (e.g car, truck, bus).



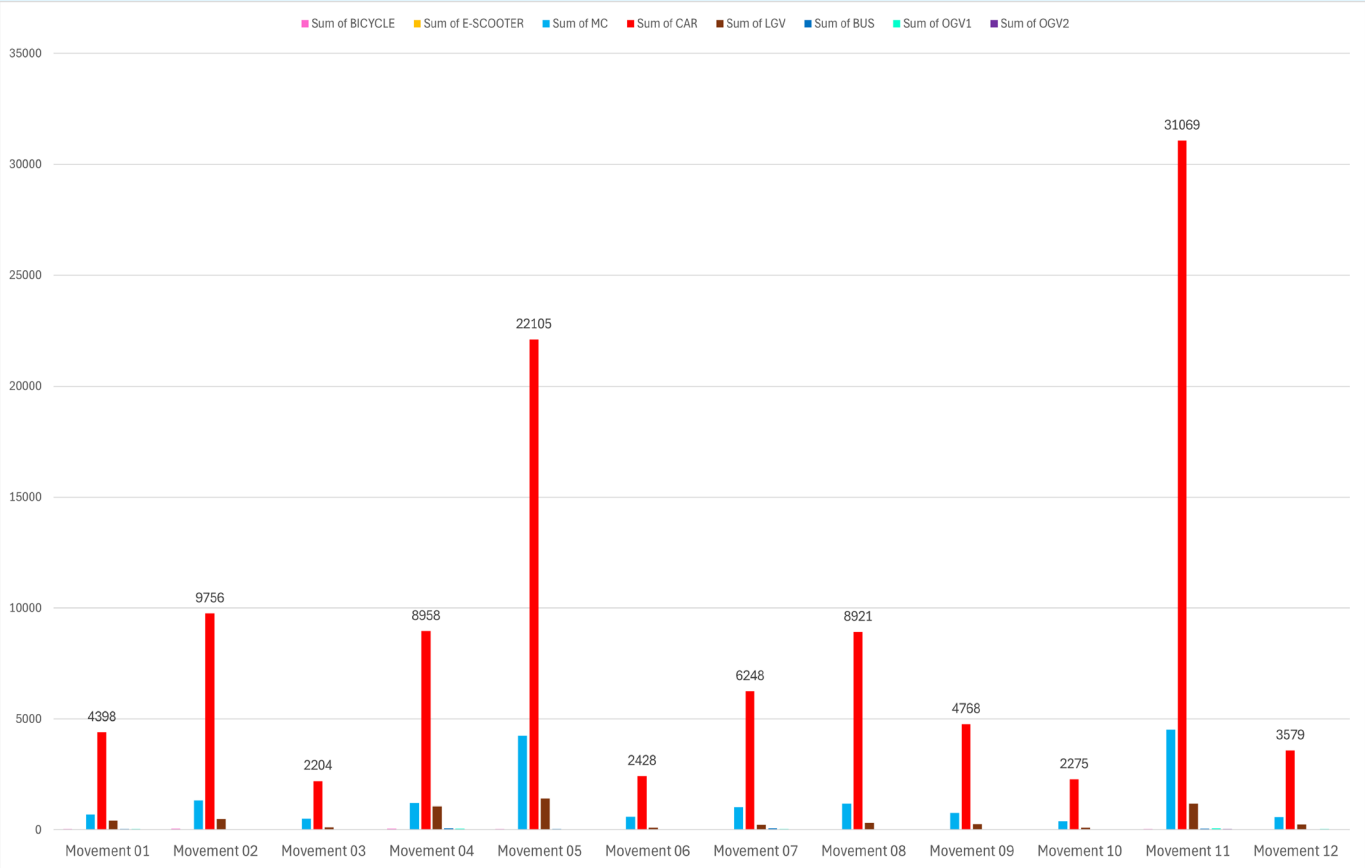
Above is a screenshot of how these count lines have been created in the AI Software to extract the relevant data. Each movement studied has a ‘Movement Label’.



Each possible movement has been translated into a ‘Movement ID’ and is displayed as a number in the graphic above. The Movement IDs relate to the road user volumes contained in the data tables on the following page.

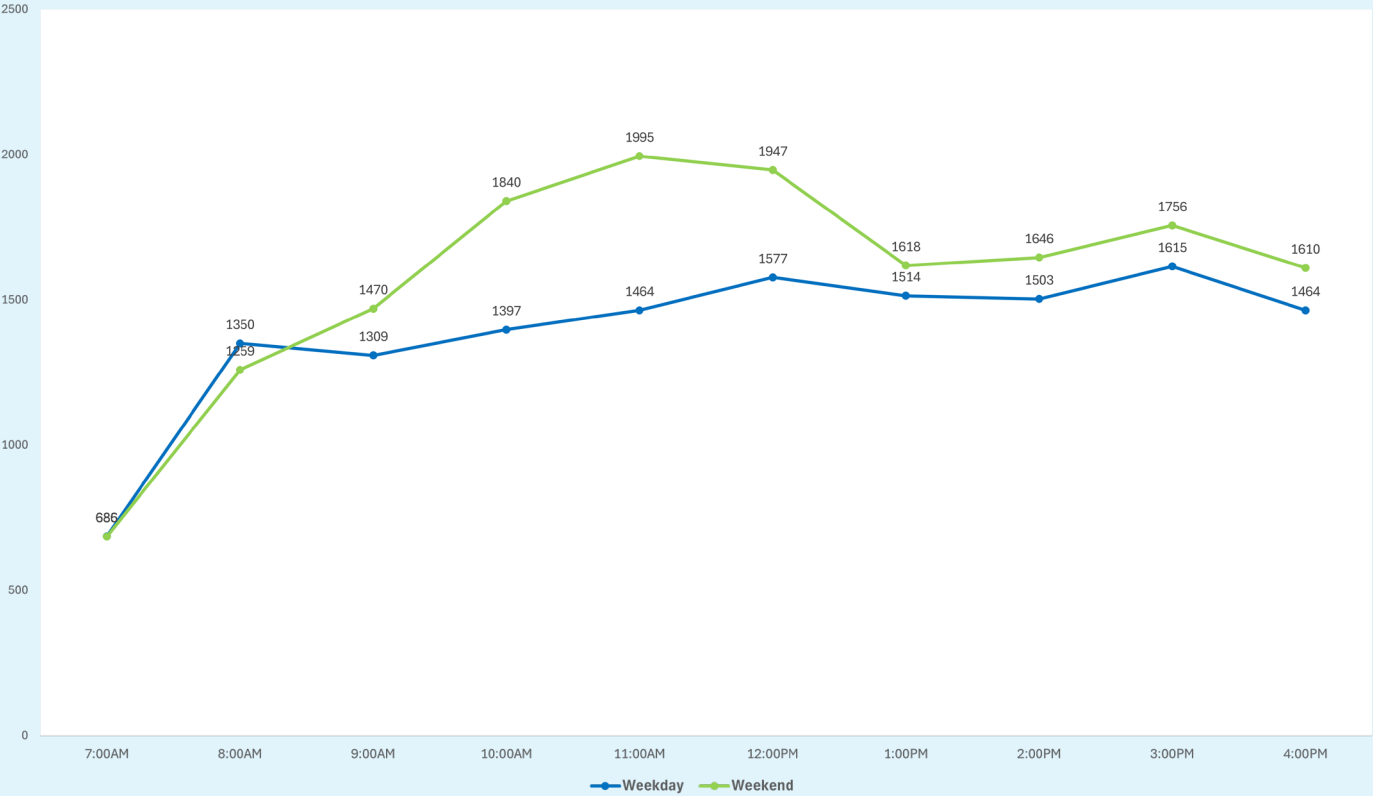
Road User Volumes and Movements

Road User Volumes



MC-Motorcycle or Motor-scooter, **E-SCOOTER**-E-scooter or other micro-mobility e-rideables, **LGV**-Light Good Vehicle (Van/Ute), **OGV1**-Other Goods Vehicle 1 (Heavy Vehicle, 2 or 3 axles), **OGV2**-Other Goods Vehicle 2 (Heavy Vehicle, 4+ Axles)

Hourly Road User Volumes (All Users)



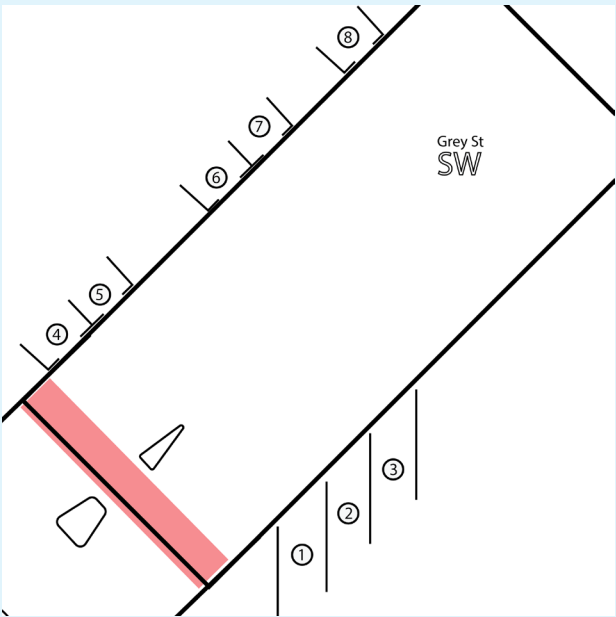
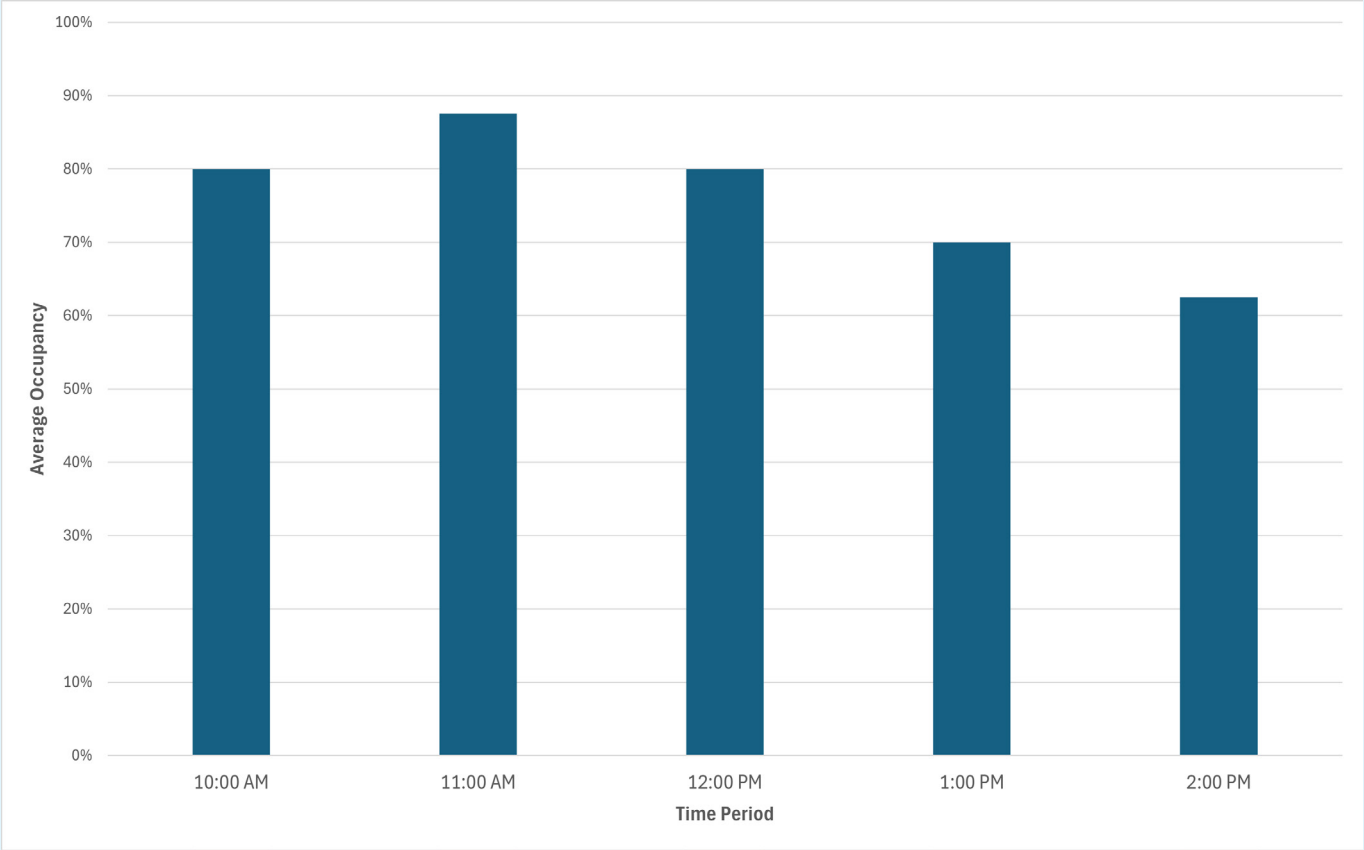
Average hourly road user totals (All user types and movements).

*For greater detail of the data table, please open the accompanying Excel Worksheet.

Car Parking Occupancy

Calculating Occupancy

Bicycle Network reviewed the footage between the hours of 10:00am and 3:00pm and logged the occupancy and turnover of vehicles in the 8 provided spaces that were visible to the camera.



The average hourly carpark occupancy percentage includes both weekdays and weekend days from the survey period.

*For greater detail of the data table, please open the accompanying Excel Worksheet.

Survey Site 3: Grey St Pedestrian Crossing



Location:

Pedestrian Crossing, Grey Street, Gisborne, New Zealand, 4010

Coordinates:

-38.668180, 178.019972

Dates and Time:

Friday 23rd August to Saturday 31st August

7:00am to 6:00pm each day*

Weather conditions:

Max temp: 19 °C

Min temp 2.9 °C

Total rainfall: 12 mm (across 7 survey days):

Survey Site Aims:

- To determine volumes and movements of all road users*
- To determine volumes and movements of all crossing users
- Examine crossing behaviours and potential conflicts

Active Traveller Movement Tracelines

Weekday Morning - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 7:20am - 8:20am on Friday 23rd August, 2024.

Weekday Afternoon - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 4:20pm - 5:20pm on Friday 23rd August, 2024.

Active Traveller Movement Tracelines

Weekend Morning - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 9:20am - 10:20am on Saturday 24th August, 2024.

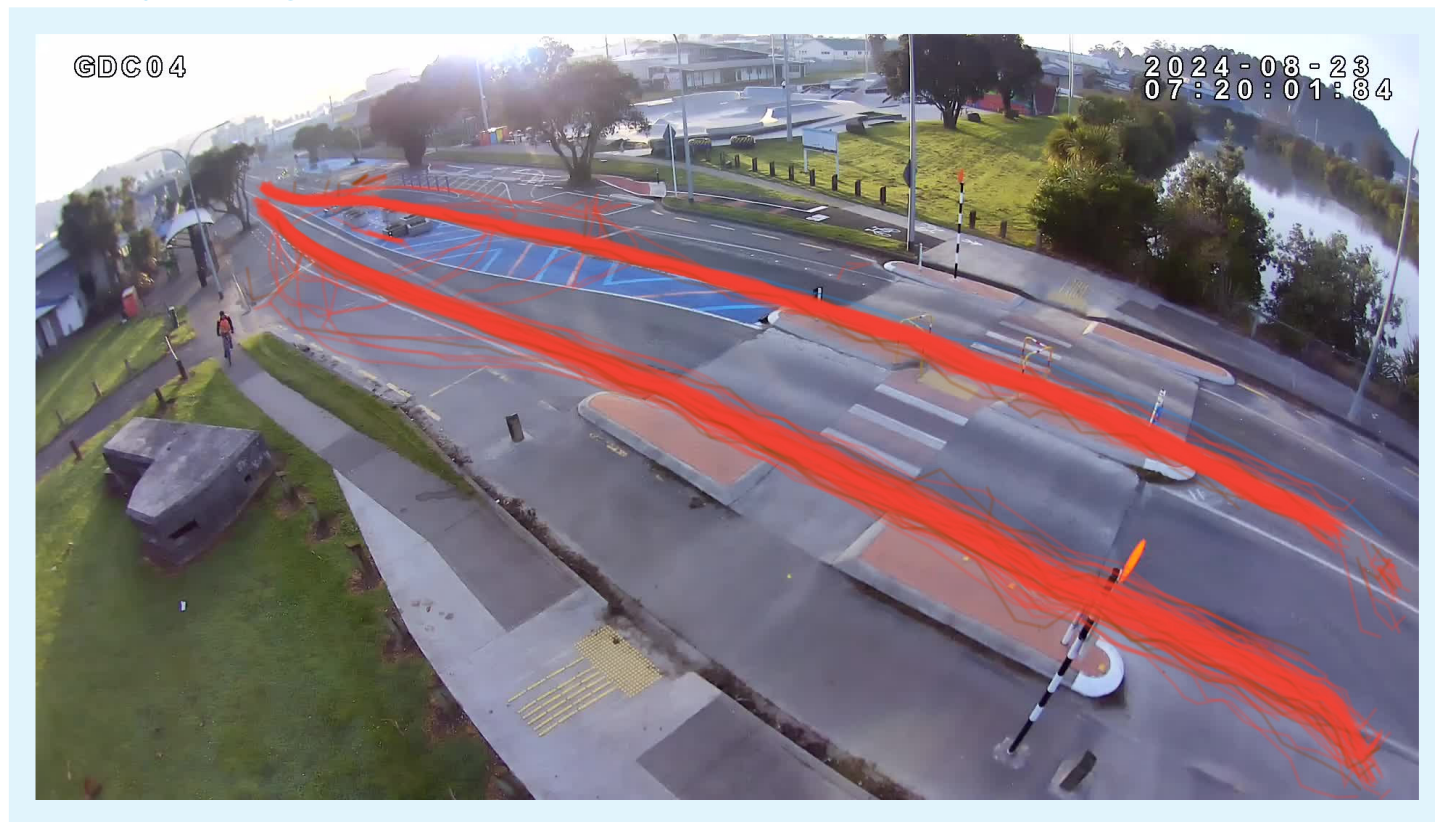
Weekend Afternoon - Active Traveller Movement Traceline Paths



Path tracelines showing the path of pedestrians (yellow lines) and bike riders (pink lines), from 3:20pm - 4:20pm on Saturday 24th August, 2024.

Vehicle Movement Tracelines

Weekday Morning - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 7:20am - 8:20am on Friday 23rd August 2024.

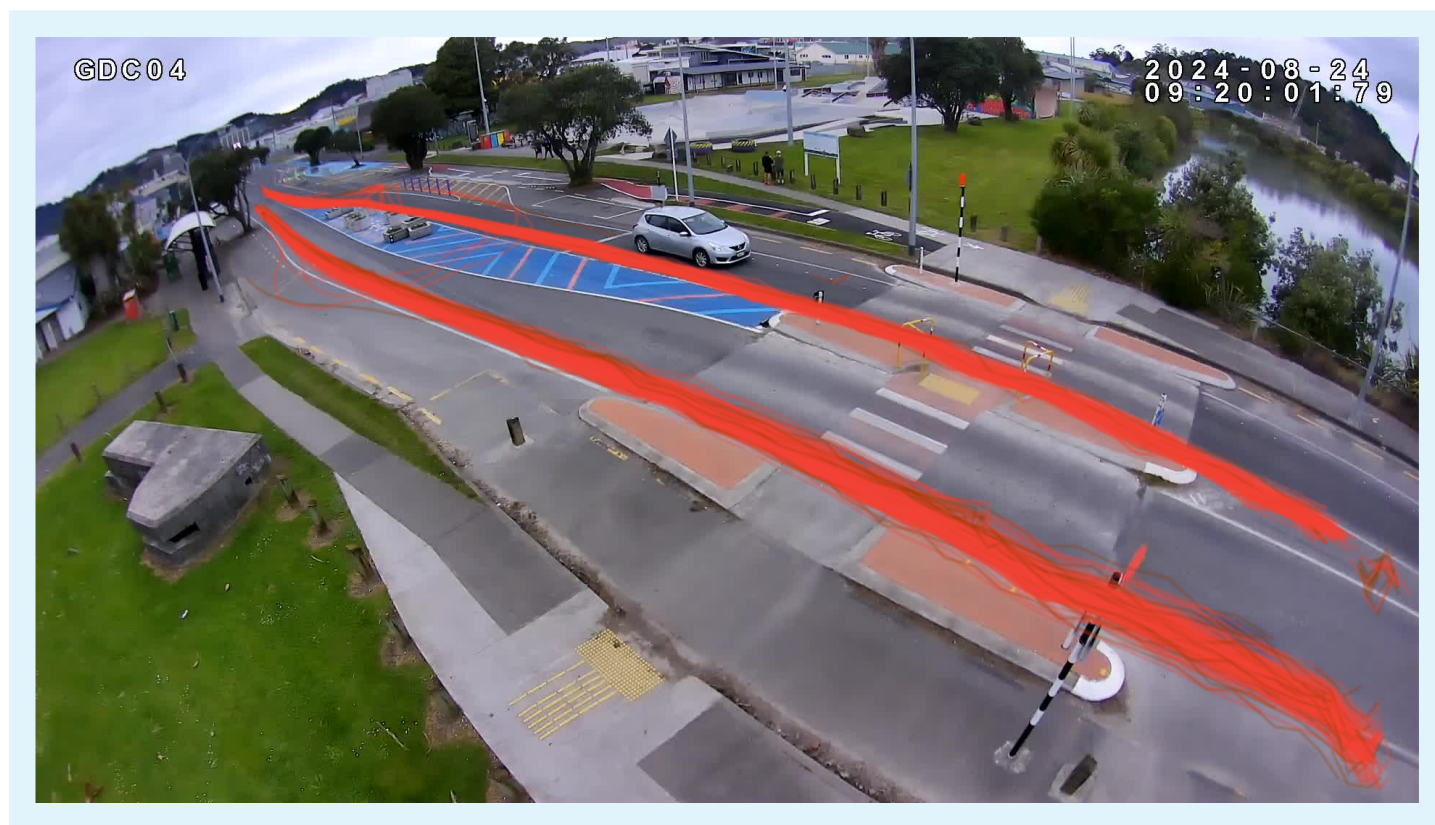
Weekday Evening - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 4:20pm - 5:20pm on Friday 23rd August 2024.

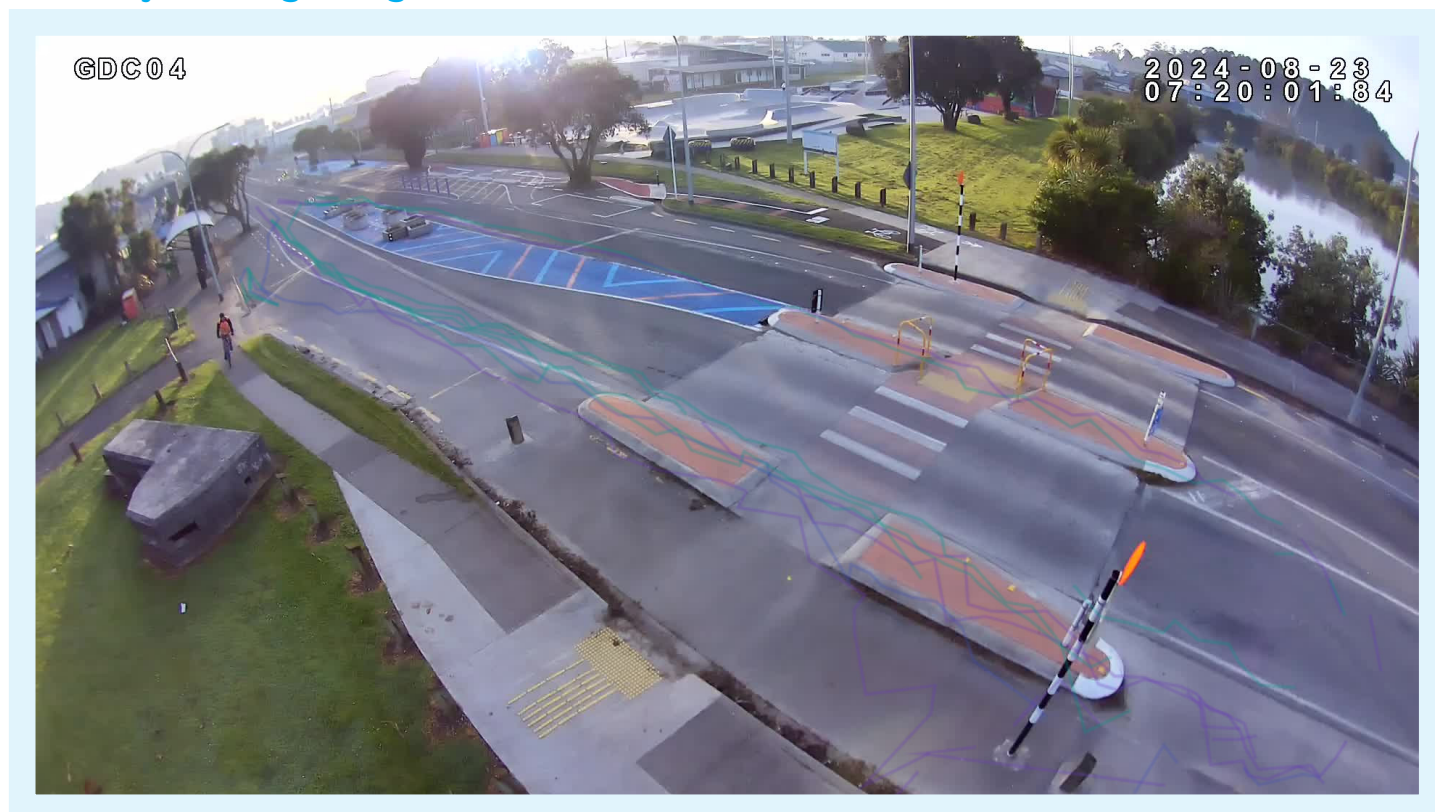
Vehicle Movement Tracelines

Weekend - Small Vehicle Movement Traceline Paths



Path tracelines showing the path of motorcycles (blue lines), cars (red lines), and LGVs (brown lines) from 9:20am - 10:20am on Saturday 24th August, 2024.

Weekday Morning - Large Vehicle Movement Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 7:20am - 8:20am on Friday 23rd August 2024.

Vehicle Movement Tracelines

Weekday Evening - Large Vehicle Movement Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 4:20pm - 5:20pm on Friday 23rd August 2024.

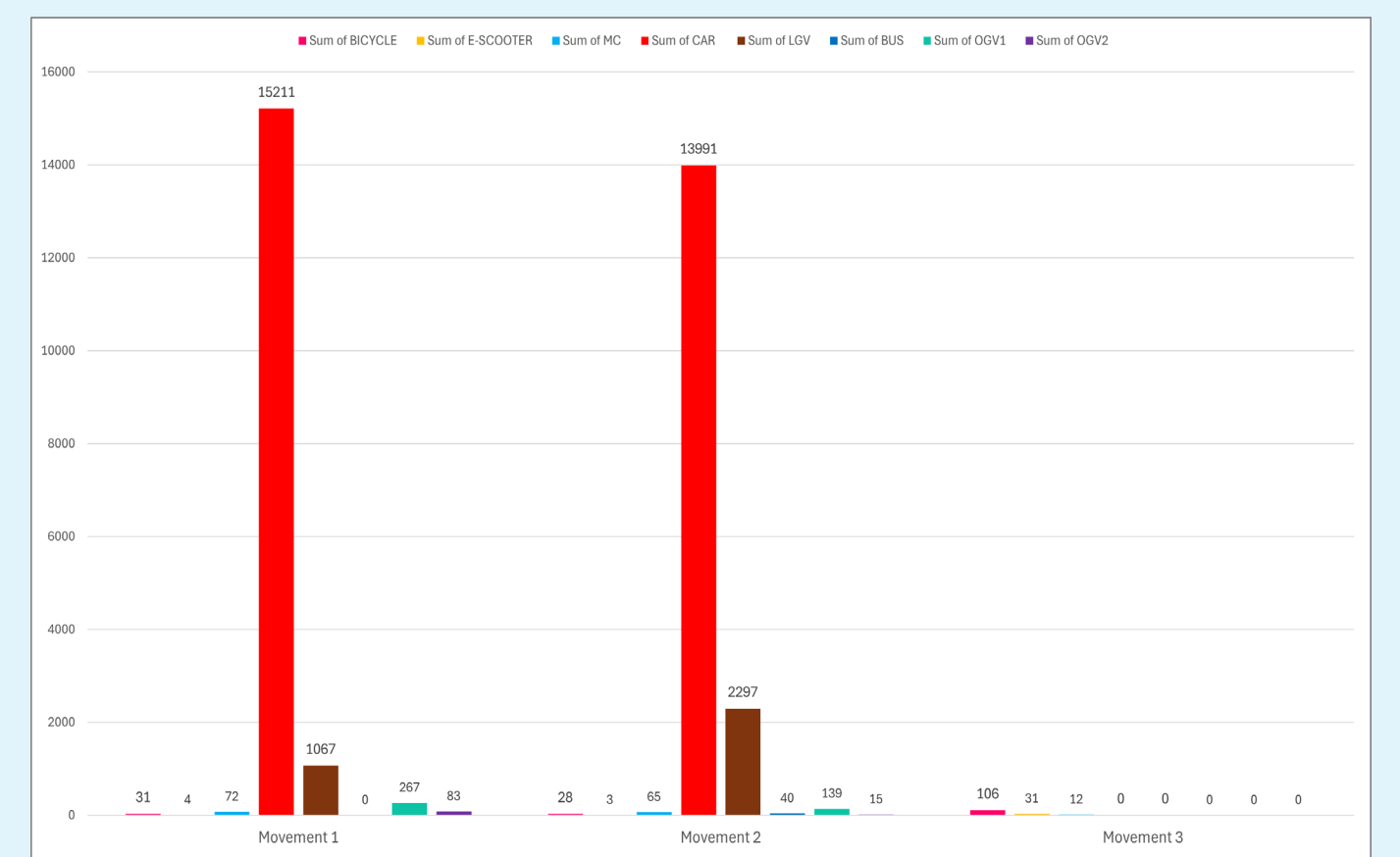
Weekend - Large Vehicle Movements - Traceline Paths



Path tracelines showing the path of buses (blue lines), box trucks (aqua lines), and semi-trailers (purple lines) from 9:20am - 10:20am on Saturday 24th August, 2024.

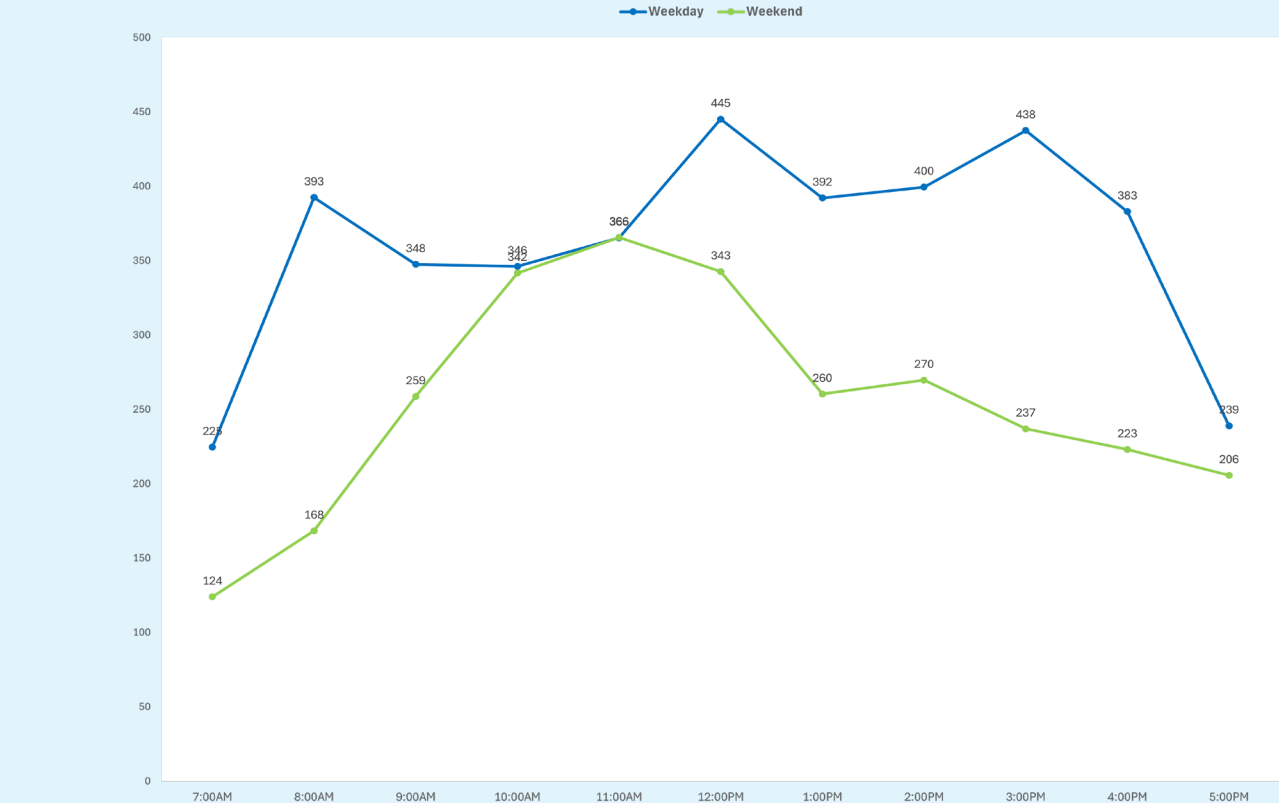
Road User Volumes and Movements

Road User Volumes



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Hourly Road User Volumes



Average hourly road user totals (All user types and movements).

[*For greater detail of the data table, please open the accompanying Excel Worksheet.](#)

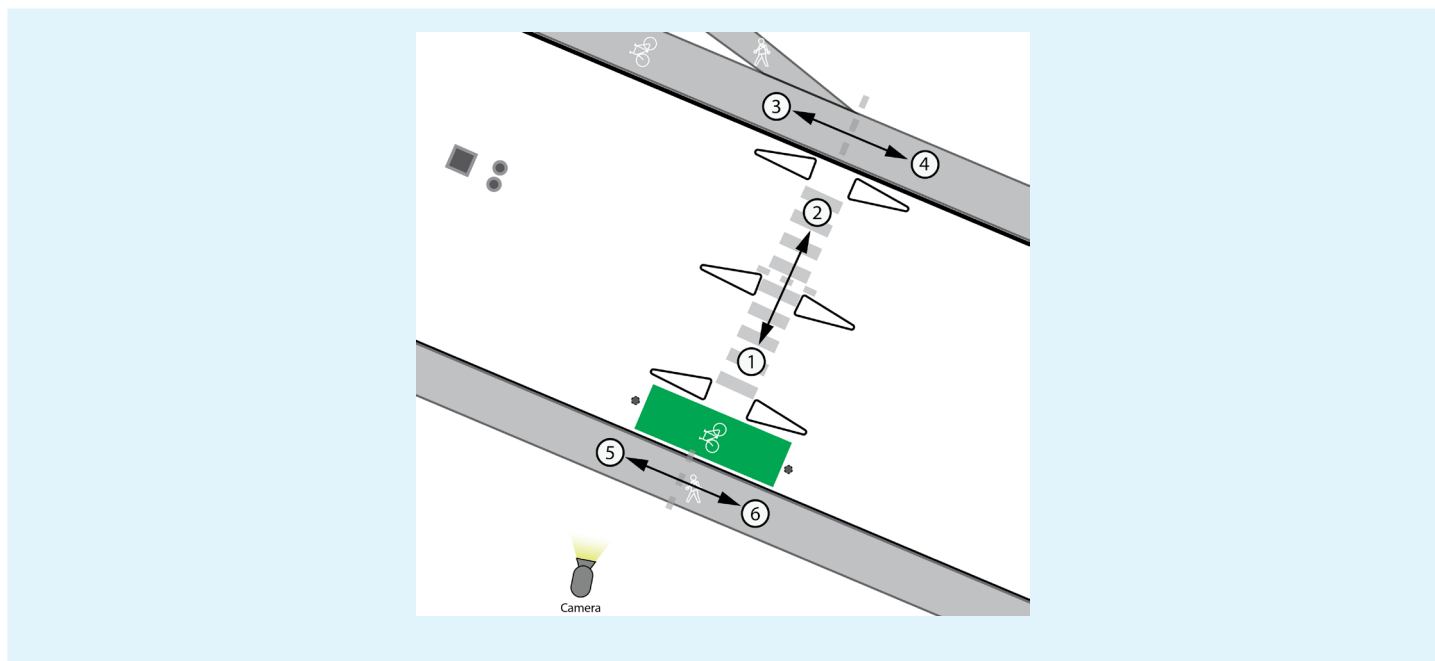
Crossing Volumes and Movements

Active Transport Volumes

To extract data from the AI Software, we have placed digital 'countlines' over the footage. The AI Software automatically counts any crossing user that passes through those lines. This allows us to study each crossing movement by road user type (pedestrian or bike rider).

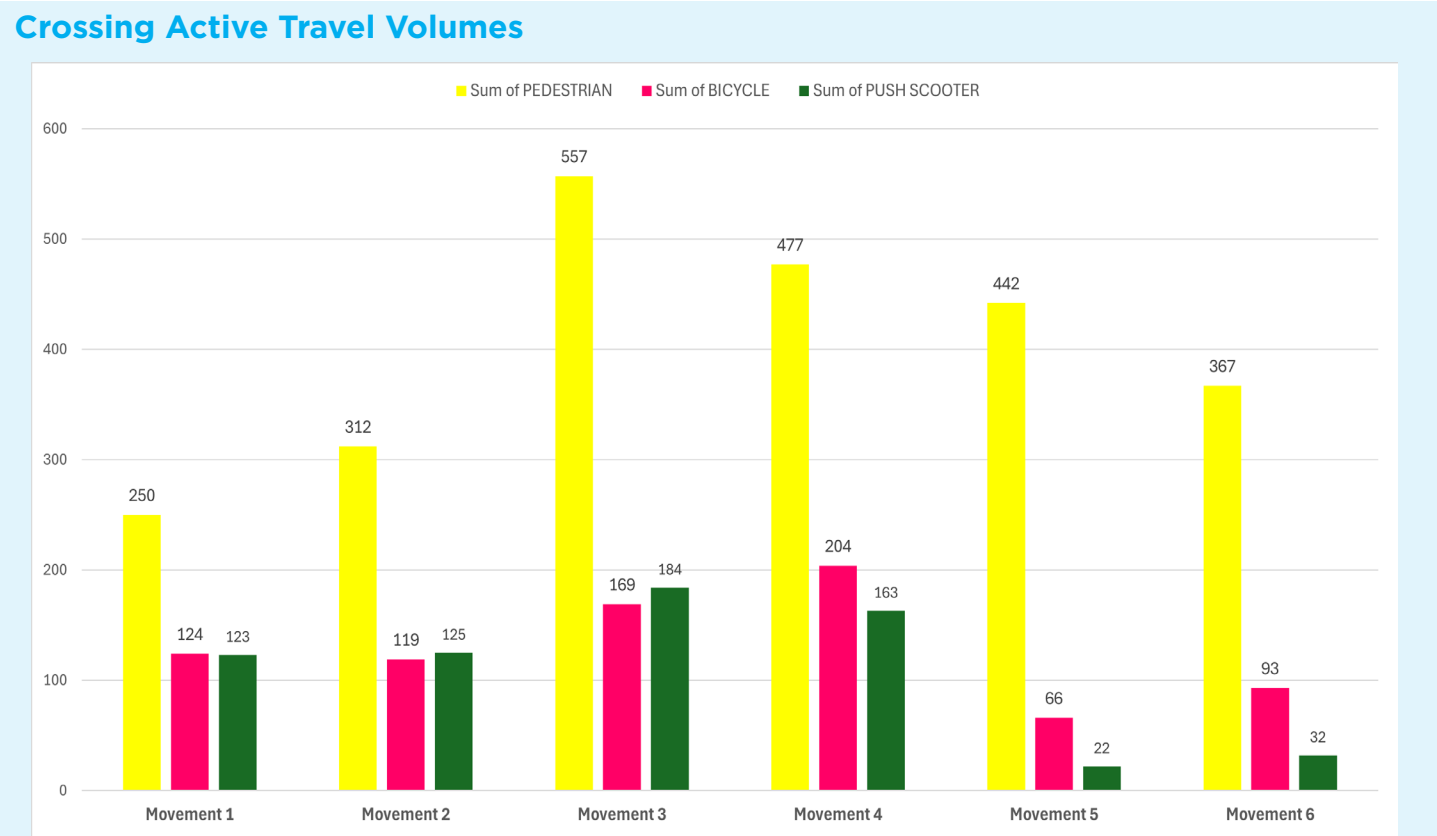


Above is a screenshot of how these count lines have been created in the AI Software to extract the relevant data. Each movement studied has a 'Movement Label'.

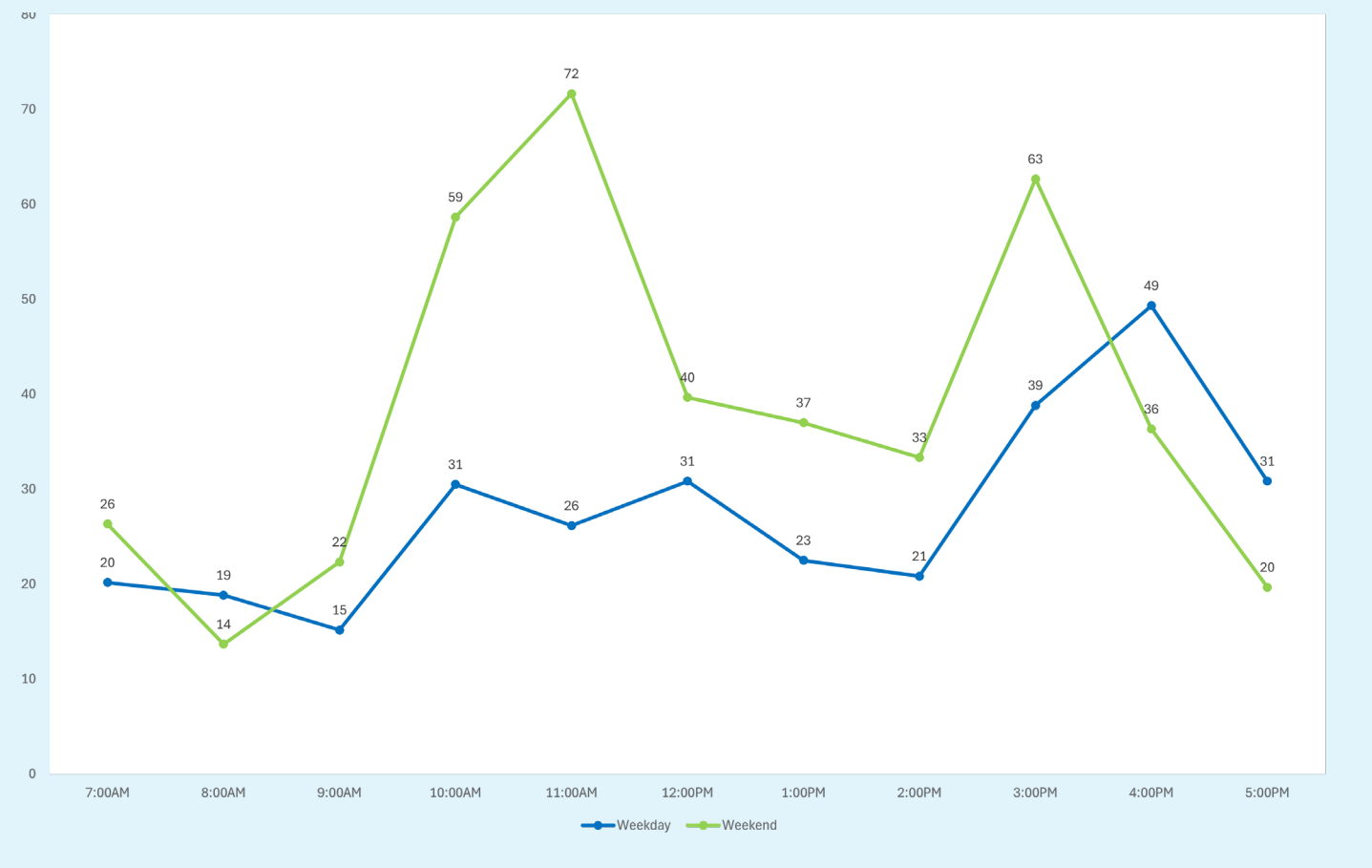


Each possible movement has been translated into a 'Movement ID' and is displayed as a number in the graphic above. The Movement IDs relate to the road user volumes contained in the data tables on the following page.

Crossing User Volumes and Movements



Hourly Crossing Volumes (All Users)

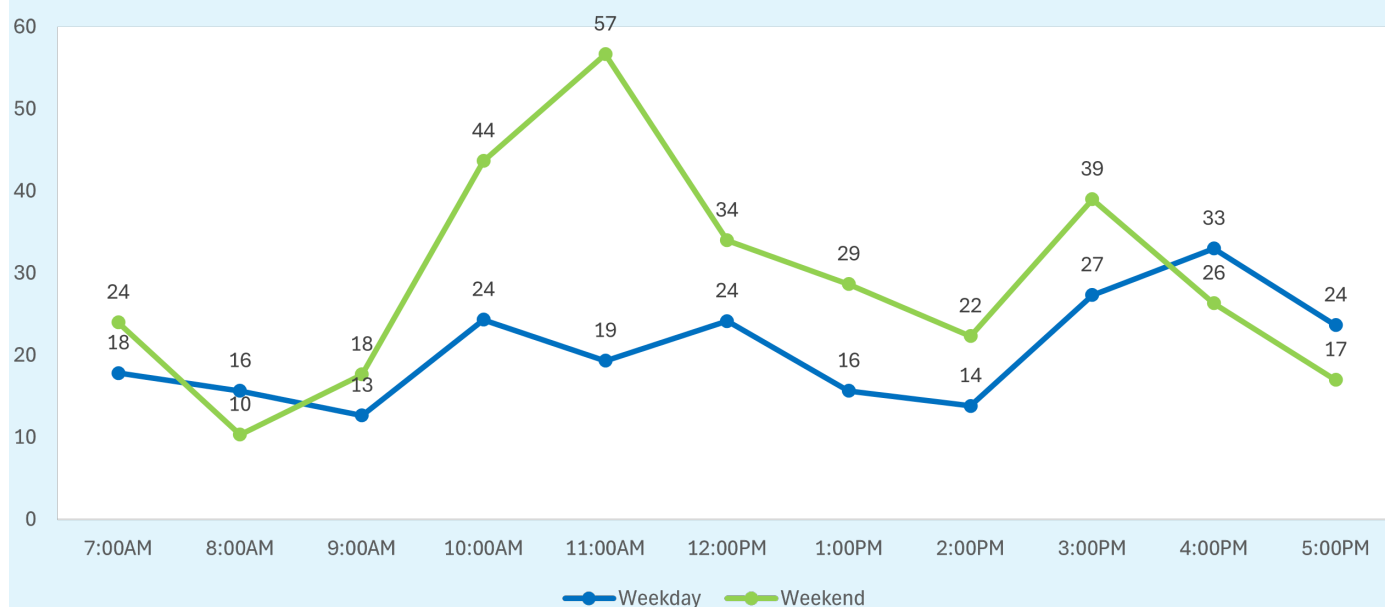


The data is organised by Movement ID, date, time and then volume of each individual crossing user type.

*For greater detail of the data table, please open the accompanying Excel Worksheet.

Crossing Volumes and Movements

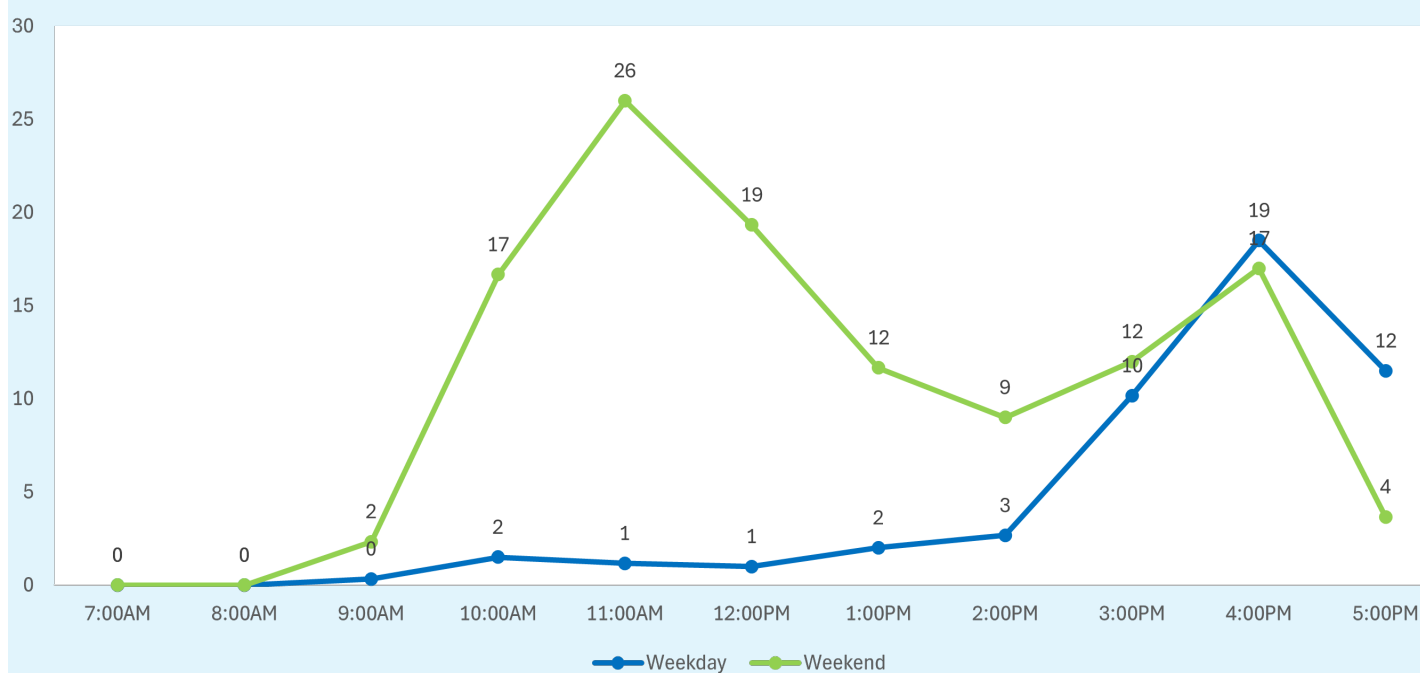
Hourly Pedestrian Volumes



Average hourly volumes of pedestrians during the survey period.

- The weekend has two main peaks of pedestrians:
 - The first peak from 10:00am - 12:00pm (approx 50 crossings an hour).
 - A second peak from 3:00pm - 4:00pm (39 crossings an hour).
- On weekdays, pedestrian volumes are more consistent across the day, with an afternoon peak at 4:00pm of 33 crossings.

Hourly Scooter (Push Scooter) Volumes

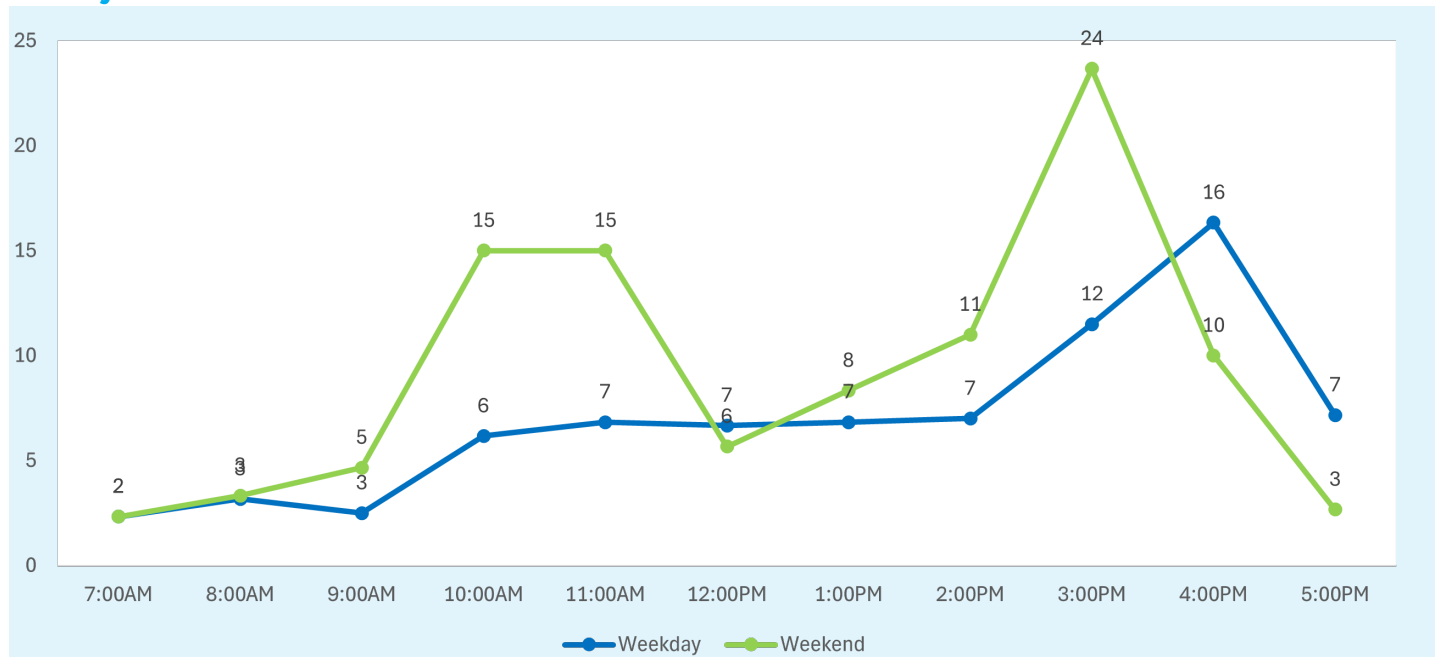


Average hourly volumes of scooter (push) riders during the survey period.

- Weekdays have a uni-modal peak of scooter users from 3:00pm - 5:00pm, which coincides with school finishing.
- On weekend days, scooter rider volumes peak between 10:00pm - 12:00pm (26 crossings).

Rider Volumes and Movements

Hourly Bike Rider Volumes



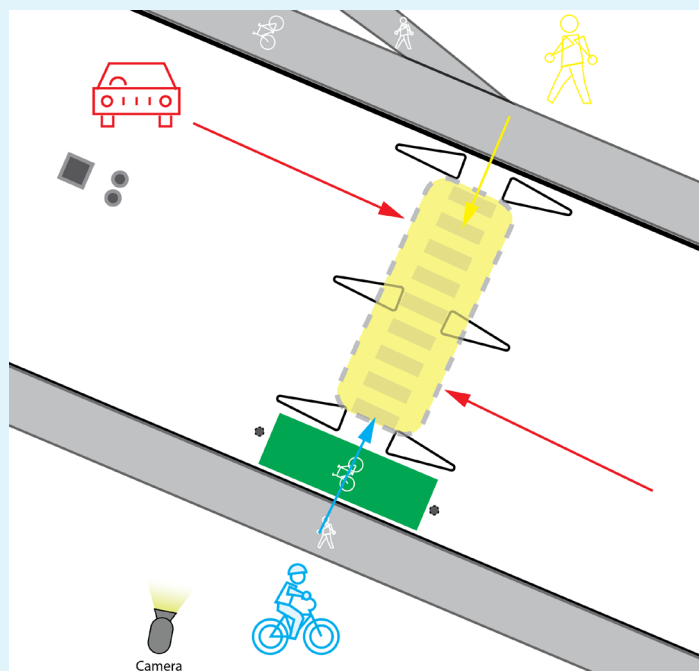
Average hourly volumes of bike riders during the survey period.

- The weekday has one main peak of bike rider crossings:
 - From 3:00pm - 5:00pm (approx 14 riders an hour).
- On weekend days, bike rider volumes experienced two main peak periods:
- Between 10:00am - 12:00pm (15 crossings per hour).
- From 3:00pm to 4:00pm (24 crossings per hour).

Crossing Behaviour Analysis

Key Measures

Road user behaviour when pedestrians, bike riders and scooter riders cross the pedestrian crossing on Grey Street.



A set of countlines captures the exact time all crossing users enter the crossing from either side. A second set of count lines captures the exact time a road user enters the described 'conflict zone'.

Crossing Behaviour Analysis

Bicycle Network reviewed all crossings that occurred during peak hours where the following condition was met: A crossing user entered the crossing within 2 seconds of a road user entering the ‘conflict zone’ shown on the previous page.

Rider and Vehicle Interaction - Conflict Severity Scale #		
Table 2#		
Score#	Title#	Description & Vehicle/Rider Response #
1#	No adjustment required#	The rider does not need to change course or speed. Vehicle may slow down or stop to allow riders to pass before turning.#
2#	Minor adjustment required#	The rider may need to slightly alter their speed or course to negotiate a turning vehicle. The situation is unlikely to be perceived as unsafe or stressful, but may be perceived as inconvenient.#
3#	Major adjustment required#	The rider may need to significantly alter their speed or course to avoid a collision with a vehicle. There is an expected moderate level of stress from one or both parties. However, this adjustment by the rider avoids a collision.#
4#	Near Miss#	A rapid change of course or speed is required by either driver or rider to avoid a collision. There is an expected high level of stress from one or both parties. Either party may gesture to one another.#
5#	Collision#	There is physical contact between parties, or the rider may come off their bicycle due to having to make a rapid evasive manoeuvre.#

Bicycle Network uses a severity scale to score each incident detected using the AIRS conflict analysis methodology (See table 2 above).

After reviewing each potential conflict detected, there were zero conflicts that were scored level 2 or above during the survey period.

On two occasions drivers continued through the crossing as a pedestrian enters the road from the other side of the crossing (see screenshot below), however these presented minimal risk and were scored as level 1 on the scale.



Image showing pedestrian using the crossing as a vehicle continues without stopping (See video clip #1).



BICYCLE NETWORK®

With nearly 50,000 members, Bicycle Network is the largest member-based bike riding organisation in Australia. At Bicycle Network, we campaign for better conditions, infrastructure and policies that make it easier and more accessible for people of all ages and abilities to ride a bike. We work closely with all levels of government to improve conditions for all people who ride.

Did you know that at Bicycle network we also do:

RIDE2SCHOOL

Our Ride2School team work collaboratively with schools, students and councils to help young people overcome the barriers preventing them from riding to school and getting active. Schools engaged in the year-long program report an active travel rate of 45 per cent, nearly double the national average. Other Ride2School initiatives include:

MIND.BODY.PEDAL – a one-day program aimed at empowering and inspiring secondary school aged females. It is designed to address the unique barriers holding teenage females back from being physically active.

ACTIVE PATHS – is a collaborative way-finding initiative, designed to make the journey to and from school as safe, fun and easy as possible!

Find out more by visiting ride2school.com.au or contacting ride2school@bicyclenetwork.com.au.

ADVOCACY AND CAMPAIGNS

We work with government, stakeholders, and the community to improve the bike riding environment across Australia. We provide expert advice on transport planning, and campaign for policies that support people riding bikes.

If you want our help on a bike riding issue or active transport plan in your LGA, reach out to our Public Affairs team at campaigns@bicyclenetwork.com.au

GET IN TOUCH - If your council would like to explore opportunities to collaborate with Bicycle Network or our members in the future, please get in touch with via bikefutures@bicyclenetwork.com.au

BIKE PARKING

Bicycle Network are the bike parking experts – we design, quote, construct and install a wide range of bike parking and end-of-trip facilities for Council's and private developments.

For more information, visit bicyclenetwork.com.au/bike-parking-experts or email parking@bicyclenetwork.com.au (1300 727 563)

PARKITEER - BIKE CAGES

We manage a network of 130 secure bike parking cages at public transport hubs across Melbourne and regional Victoria on behalf of the Department of Transport.

Learn more at parkiteer.com.au or by contacting parkiteer@bicyclenetwork.com.au

RIDES AND EVENTS

We run some of Australia's biggest bike rides, including The Great Vic Bike Ride (3,000+ riders), Around the Bay (10,000+ riders), the Great Outback Escape (NT), the iconic Peaks Challenge Falls Creek (VIC) and many more. We also coordinate regular social bike rides to help encourage riding and discuss the concerns of the riding public.

To organise events and social rides in your LGA, visit bicyclenetwork.com.au/rides-and-events

CORPORATE MEMBERSHIPS

Sign up as a corporate member and your employees will be able to take advantage of our exclusive corporate membership offer. In addition to helping us improve bike riding conditions across Australia, our members are covered every time they ride with our bike riding insurance. Plus, they'll get access to a range of services and discount offers.

Contact us at membership@bicyclenetwork.com.au



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