

# Benefits of New and Improved Pedestrian Facilities

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# Overview

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- Research Purpose and Objectives
- Key Literature Review Findings
- Study Methodology – Pedestrian Count Periods
- Case Study Site Characteristics
- Details on two Case Studies
  - Site 1 – Tristram Street, Hamilton (Refuge)
  - Site 2 – Sparks Road, Christchurch (Zebra)
- Results of Before and After Site Assessments
- Results from Pedestrian Surveys
- Conclusions

# Research Purpose and Objectives

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- Purpose – to get and insight into what situations pedestrian crossing facilities lead to an increase in walking trips and how pedestrians value various crossing facilities
- Objectives:
  - To record the additional trips that are generated from new or upgraded pedestrian crossing facilities
  - To understand the importance that various pedestrian facilities have on pedestrian perception of safety, delay and directness.
  - To demonstrate the importance of collecting more before and after data on pedestrian facilities to better understand how investment in this area contributes to an increase in walking (improve walkability)

# Key Literature Review Findings

- Not a lot of research available on this topic
- City of Camas and Washington State DoT (1999)
  - The new cross-walk lead to an increase in the pedestrians crossing at the facility location

**Table 1: Percentage of Pedestrians Crossing Everett Street: Before and After**

Crossing Location	Before	After
19th Ave/Everett St (within crosswalk)	78%	83%
19th Ave/Everett St (outside crosswalk)	9%	7%
Everett St: Mid-block (17th to 19th and 19th to 21st)	9%	3%
Everett St: Adjacent Intersections (17th and 21st)	4%	7%

# Key Literature Review Findings cont...

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- Sharples et al 2001
  - Pedestrian surveys at 30 sites across six towns and cities in Scotland
  - Ten different crossing types involved
  - On-street survey of public with self-completion survey for school kids
  - Included range of mobility impairments
  - Main reasons for using formal crossing facilities
    - convenience, directness of route and safety
  - Main reasons for not using such facilities
    - 'traffic was light' and 'it would take too long'
  - Main factors for using formal crossing
    - Road safety – 96%
    - Volume of traffic – 91%
  - Pedestrians prefer traffic signals, then zebras and then crossing aids

# Study Methodology

- Focus on mid-block facilities:
  - Traffic signals,
  - Zebra,
  - Kea (school) crossing &
  - Refuges with/without kerb extensions
- Search for sites in
  - Auckland,
  - Hamilton,
  - Christchurch,
  - Dunedin, &
  - Melbourne
- Eight sites selected

Category	Description
Site characteristics	Included quality of footpaths, characteristics of surrounding area, level of signage, availability of resting places, other crossing facilities in vicinity of the subject facility and types of pedestrians in the area.
Land Use	The predominant land use in the general area and that fronting the pedestrian facility.
Road Classification and Traffic Flows	This was collected from Local Authorities.
Road Cross-Sections	Included number of lanes, median type, seal width, crossing distance.
Weather	The weather conditions during the survey were recorded.
Accident Statistics	Accident history within 50m either side from the facility for the period 2003-2007 was collected from the NZTA Crash Analysis System (CAS).
Promotion and Community Consultation	Any community consultation and promotion of the facilities such as a local promotion campaign or similar marketing strategy from the Local Authorities was noted.
Drivers for Construction of New Facility	This covered road construction, whether problem site – delay or safety issues, whether part of area-wide strategy, or any other.

# Selection of Count Period(s)

Figure 1: Coefficient of variance between quarter hour counts on weekdays

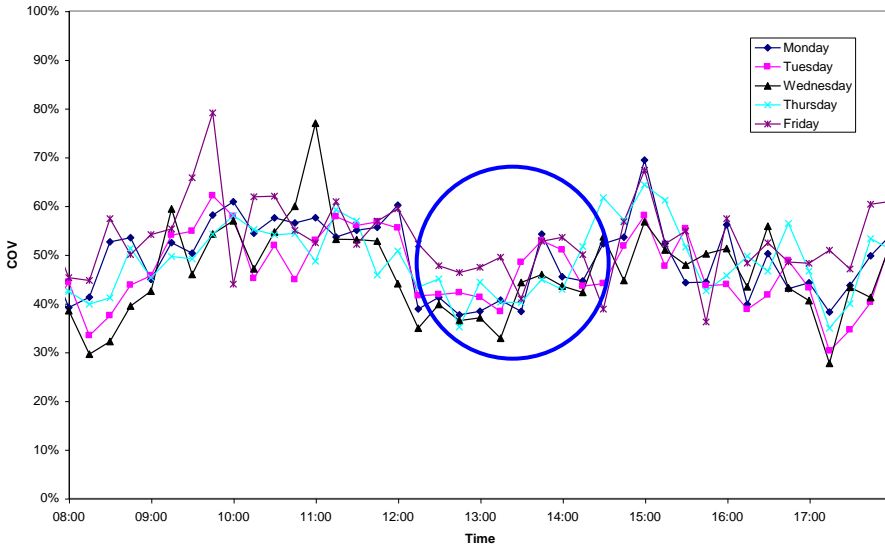


Figure 2: Coefficient of variance between quarter hour counts on weekends

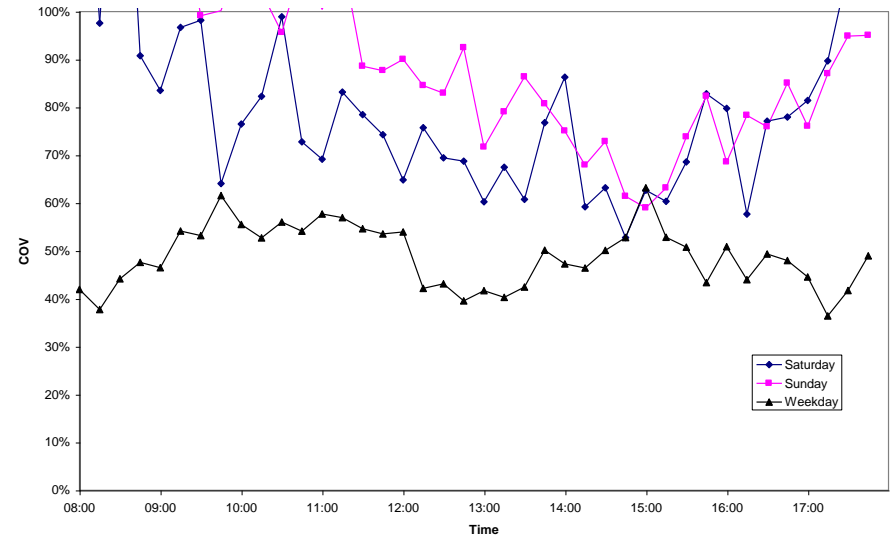


Table 2: Increase in pedestrian volumes required for statistical significance

Scenario	Mean COV	n (Number of 15 minute survey intervals)
2-hr continuous count (as proposed);	50%	8
4-hr continuous count	56%	16
Two, 1.5 hour counts on adjacent weeks	47%	12

## Pedestrian Surveys

- On Wednesdays for 1 & ½ hrs from 12
- In 15 min intervals
- For three consecutive weeks
- Before and after treatment
- Not to close to treatment

# Case Study Site Characteristics

Table 7: Overview of study sites

Location	Type of Improvement	Road Category	Land Use	AADT	“Before” Study (Ped/hr)
Moorhouse Ave at Hoyts 8/”Science Alive!”, Christchurch	Signalised Crossing	Six lane median divided arterial	Commercial	40,000	75
Hereford Street, Christchurch	Raised zebra crossing with warning light system	Collector	Commercial	9,500	628
Sparks Road, Christchurch	School patrolled zebra crossing	Minor Arterial	School / Residential	10,700	148
Hoon Hay Road, Christchurch	Kea Crossing	Minor Arterial	School / Residential	7,000	43
Ensors Road, Christchurch	Refuge island and kerb extension	Minor Arterial	Residential	8,2000	7
Collingwood Street, Hamilton	Kerb extensions	Collector	Commercial / Education	6,500	30
Tristran Street, Hamilton	Refuge island	Minor Arterial	Commercial / Education	21,000	25
Margot Street, Auckland	Kea crossing	Local Road	School / Residential	2,200	69



# Case Study 1 – Tristram Street, Hamilton

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- **Site location and description:**

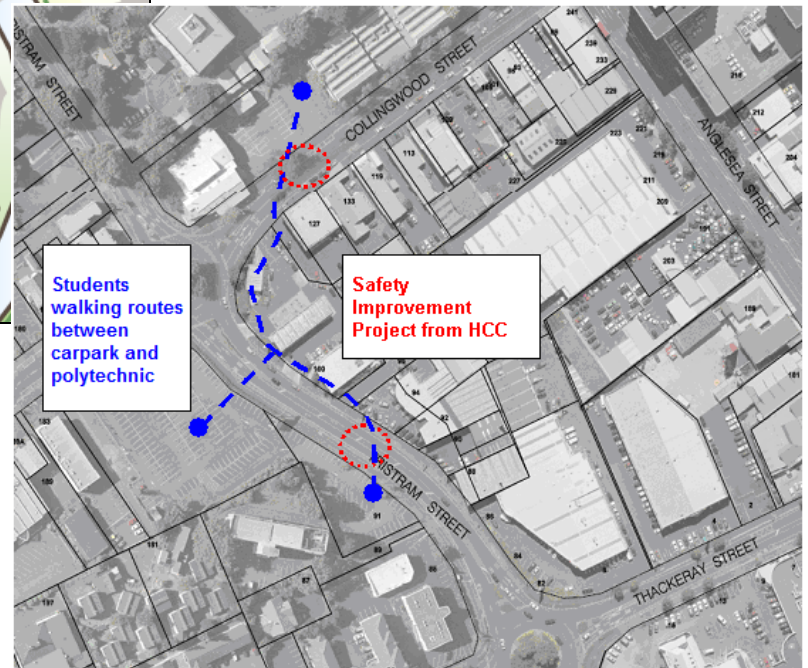
This site is also located close to the Waikato Institute of Technology in Hamilton West. There is a large pay and display car park facility on the southwest corner of the Tristram Street and Collingwood Street roundabout.

- **Proposed pedestrian facility:**

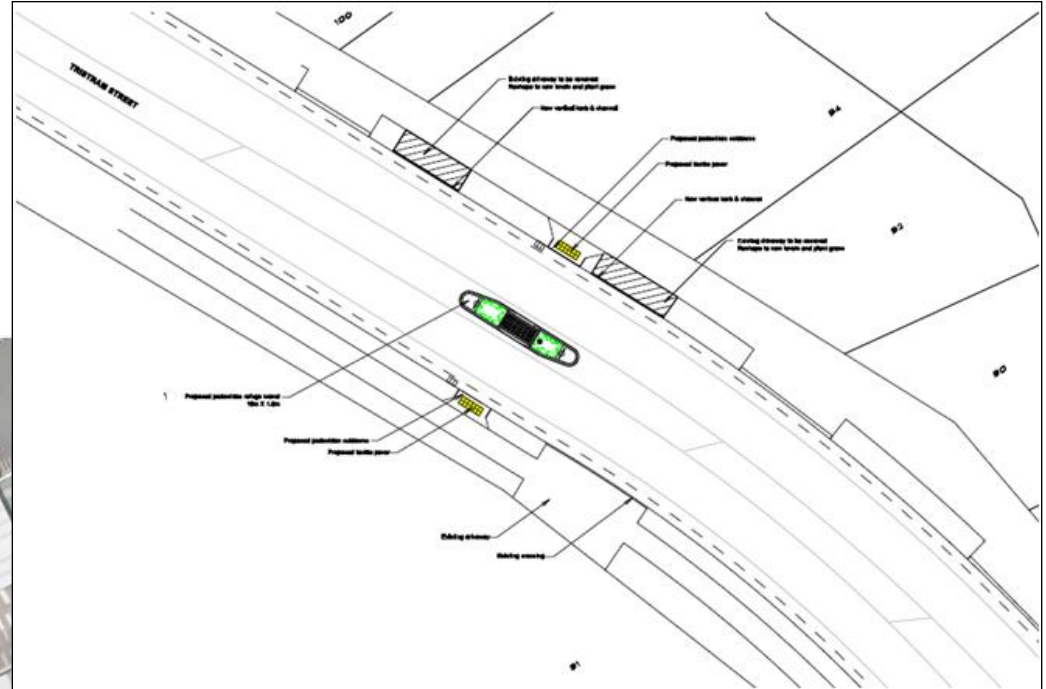
The pedestrian crossing facility at Tristram Street involved the construction of a mid-block pedestrian refuge island.

**Minor Arterial, 21,000 vehicles/day**

# Site Location



# Proposed Design

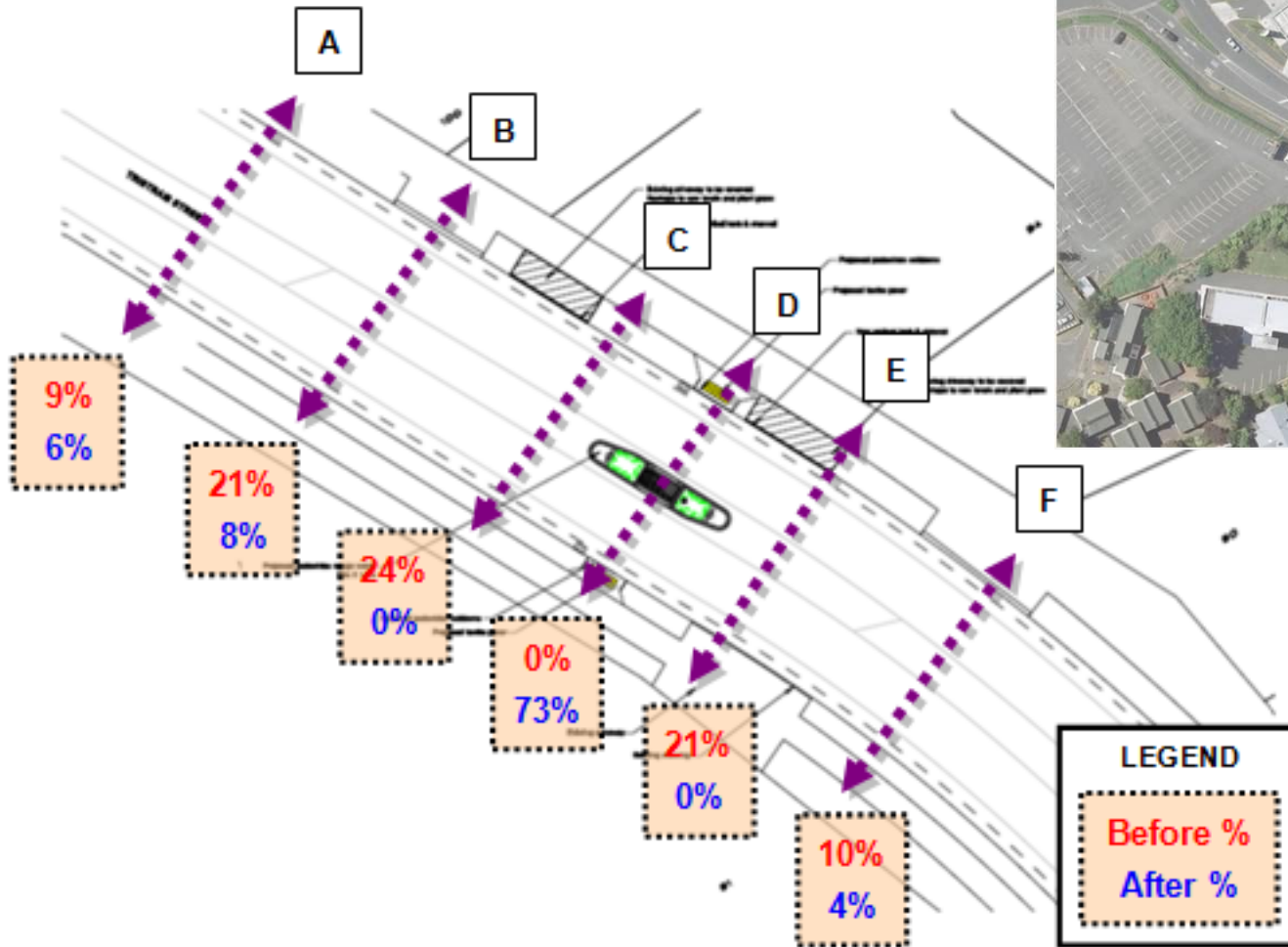


# Survey Area and Pedestrian flows

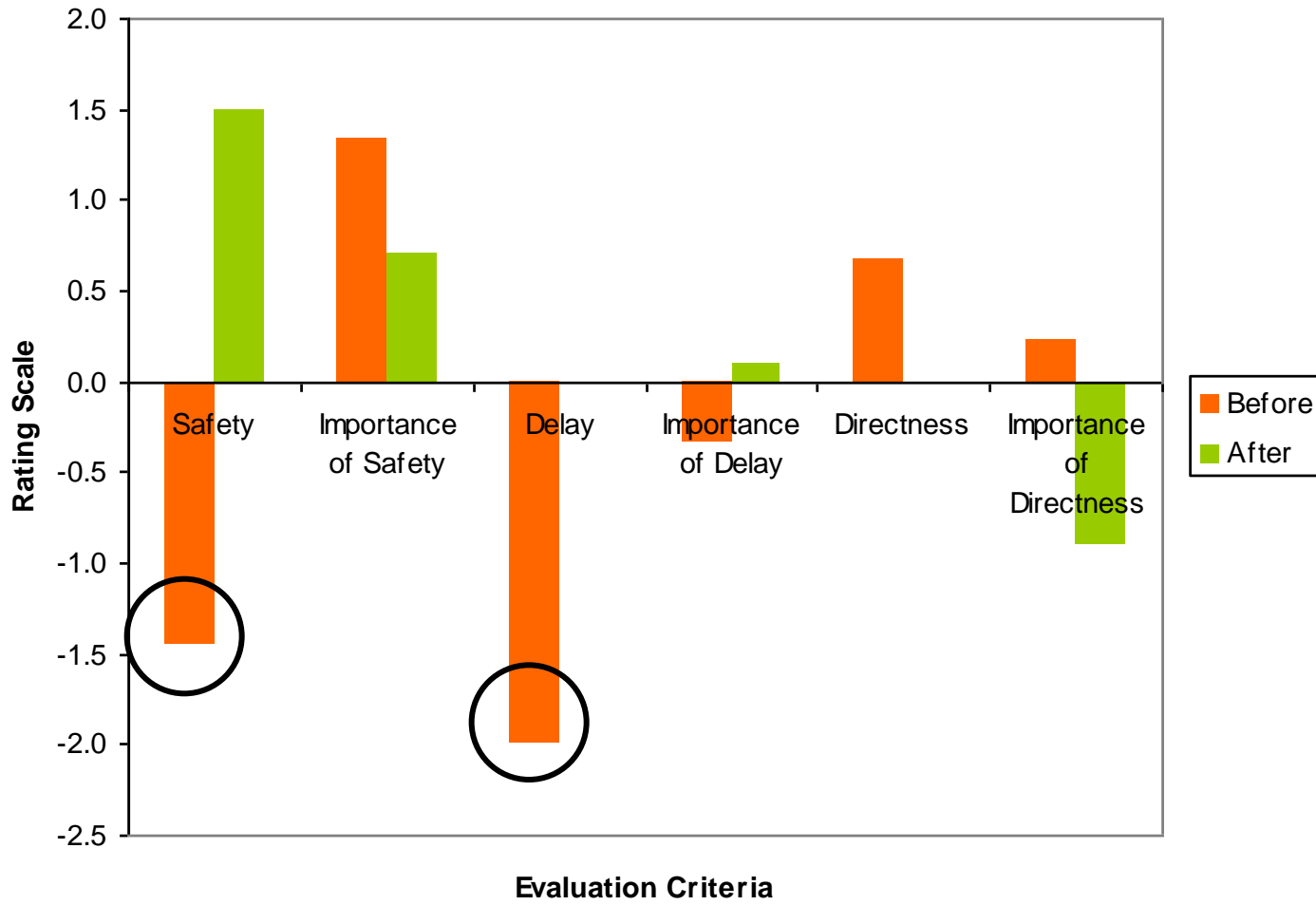


- Analysis of the survey counts shows a significant increase in pedestrians crossing within the observation area, **from 25 pedestrians per hour (February 2007 'Before' survey) to 46 pedestrians per hour (August/October 2007, 'After' survey).**
- As with the Collingwood Street facility, a doubling in use was observed and this confirms the facility as an attractive crossing for pedestrians.

# Pedestrian Crossing Locations



# Perception Survey Results



# Case Study 2 – Sparks Road, Christchurch

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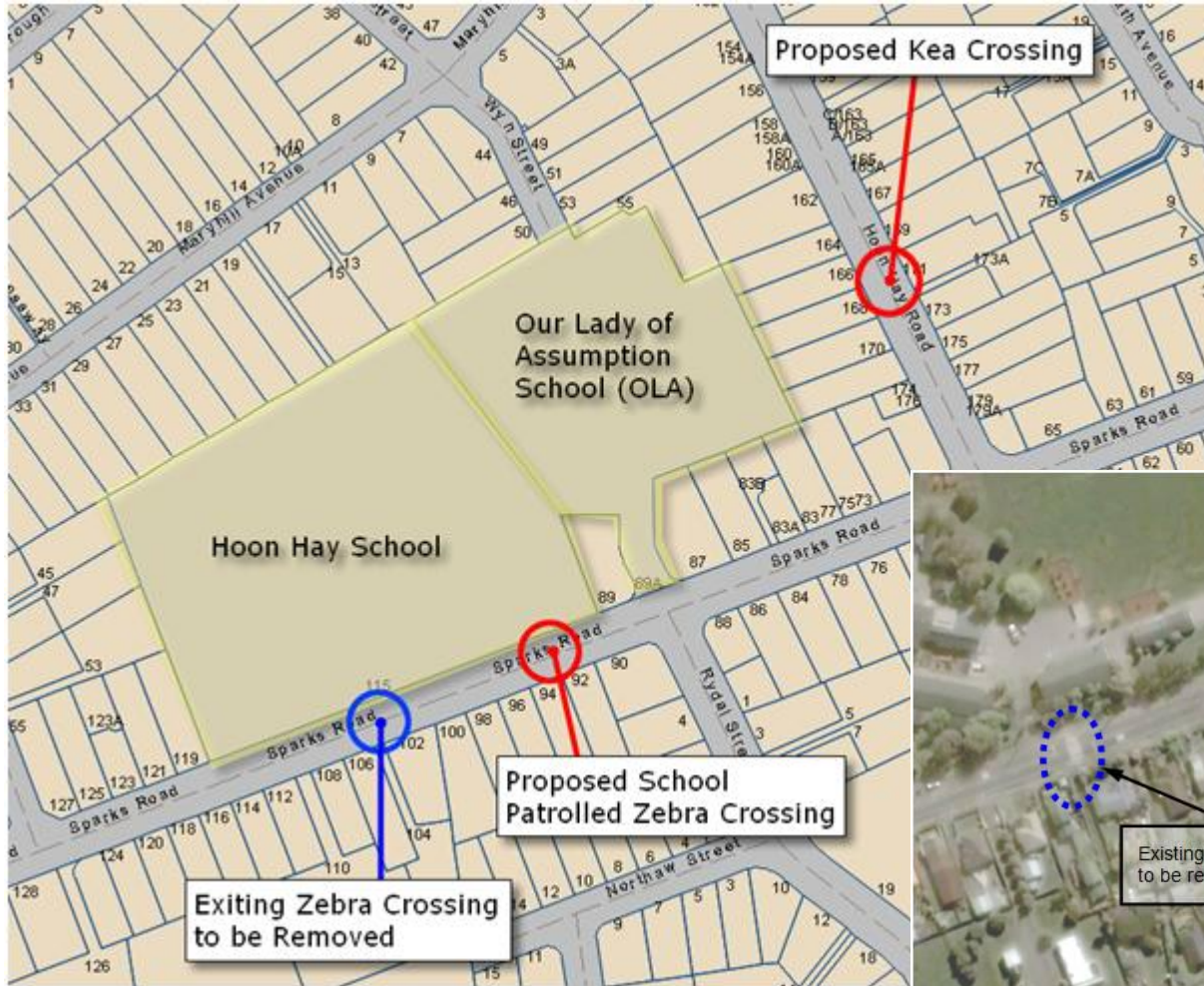
- **Site location and description:**

The site is located outside the entrance of Hoon Hay School and near the entrance to Our Lady of Assumption School (OLA) on Sparks Road.

- **Proposed pedestrian facility:**

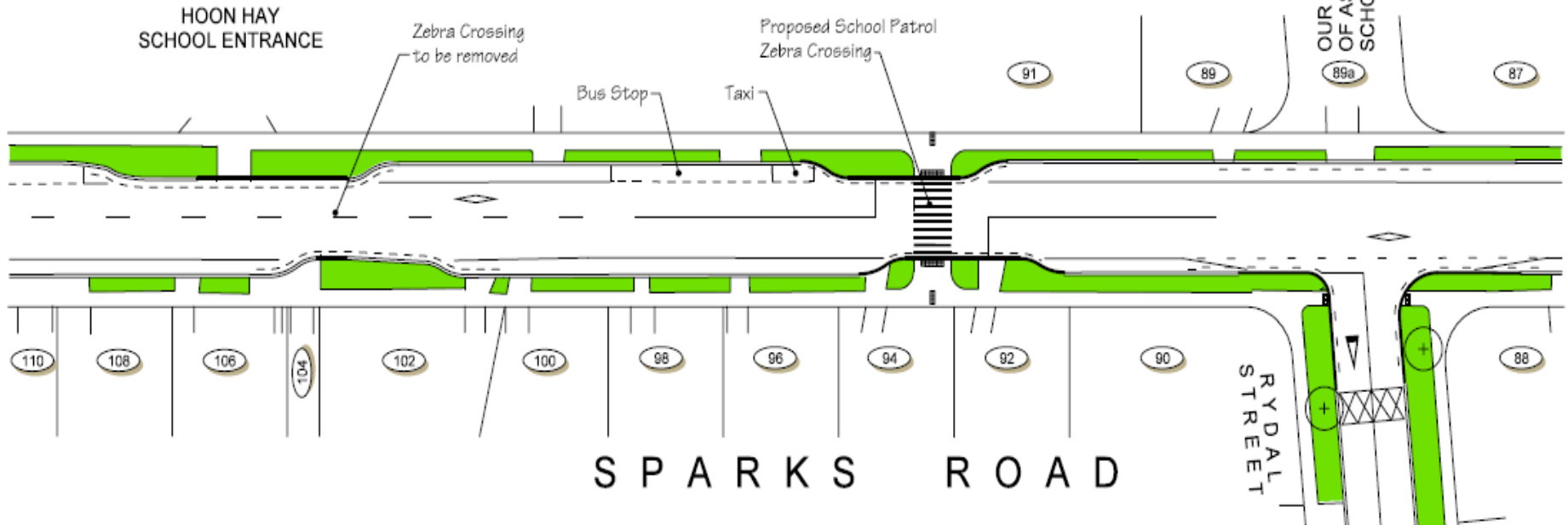
Improvements involved removal of the existing zebra crossing near the entrance to the Hoon Hay School and construction of a new school patrolled zebra crossing midway between the two school entrances.

# Site Location





# Proposed Design



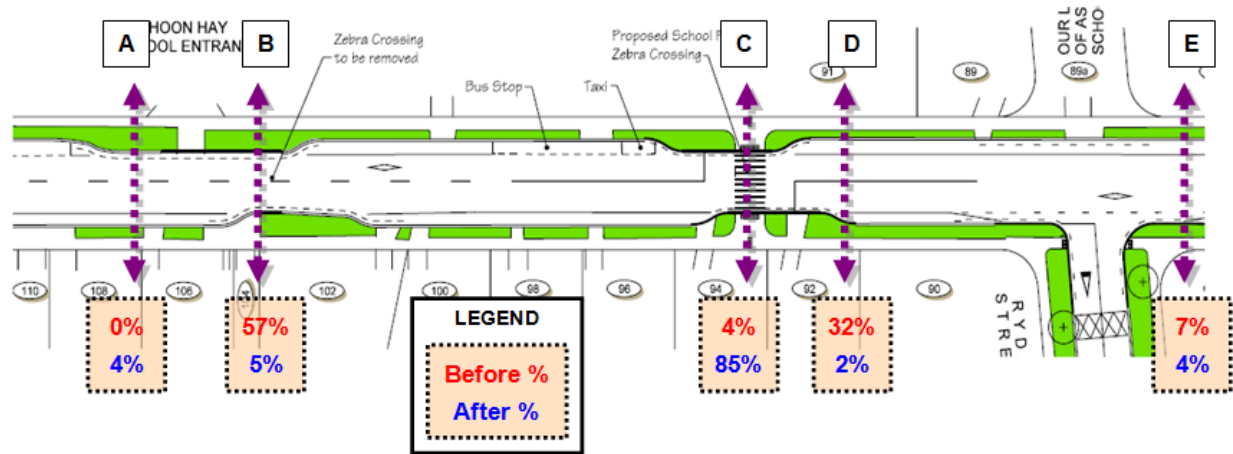
# Survey Area and Pedestrian Flows



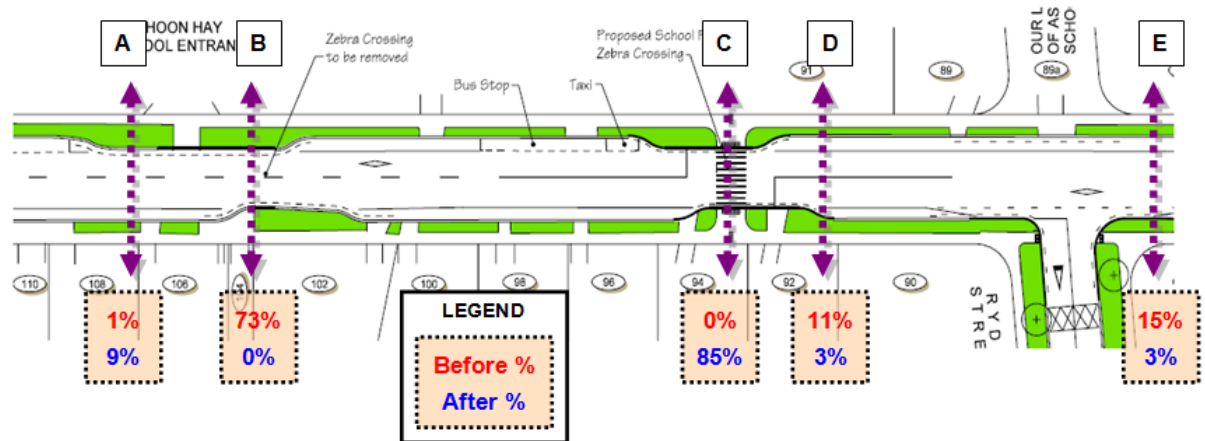
- The number of pedestrians using the site per hour over the two periods (morning and evening) surveyed increased **from 148 ('Before' survey) to 228 ('After' survey)**.
- This represents **an increase of over 50%**, and suggests that removal of the existing zebra crossing and subsequent installation of the school patrolled zebra crossing resulted in making this site more attractive for pedestrians in general and school students in particular, since they derive considerable safety benefits by utilising the patrolled zebra crossing.

# Pedestrian Crossing Locations

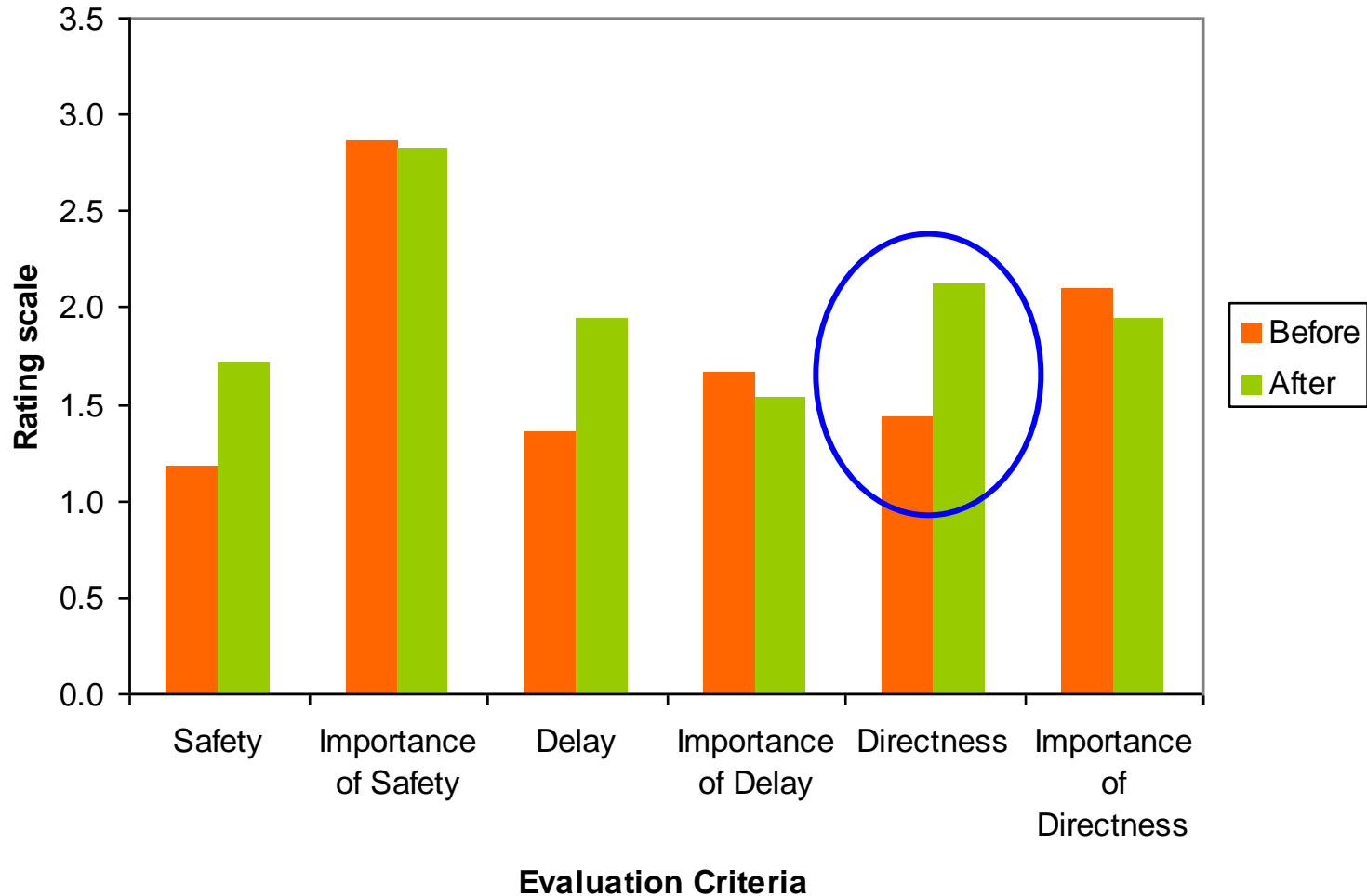
Morning  
Peak  
Pedestrian  
Crossing  
Locations



Afternoon  
Peak



# Perception Survey Results



# Results of Before and After Site Assessments

Table 8: Pedestrian numbers: Before and After

Location	Type of Improvement	“Before” Study (Ped/hr)	“After” Study (Ped/hr)	% Increase	Significant Increase?
Moorhouse Ave at Hoyts 8/”Science Alive!” , Christchurch	Signalised Crossing	75	80	7%	No
Hereford Street, Christchurch	Raised zebra crossing with warning light system	628	607	-3%	No
Sparks Road, Christchurch	School patrolled zebra crossing	148	228	54%	Yes
Hoon Hay Road, Christchurch	Kea Crossing	43	64	49%	Yes
Ensors Road, Christchurch	Refuge island and kerb extension	7	8	14%	No
Collingwood Street, Hamilton	Kerb extensions	30	57	90%	Yes
Tristan Street, Hamilton	Refuge island	25	46	84%	Yes
Margot Street, Auckland	Kea crossing	69	98	42%	Yes

# Perceived Safety

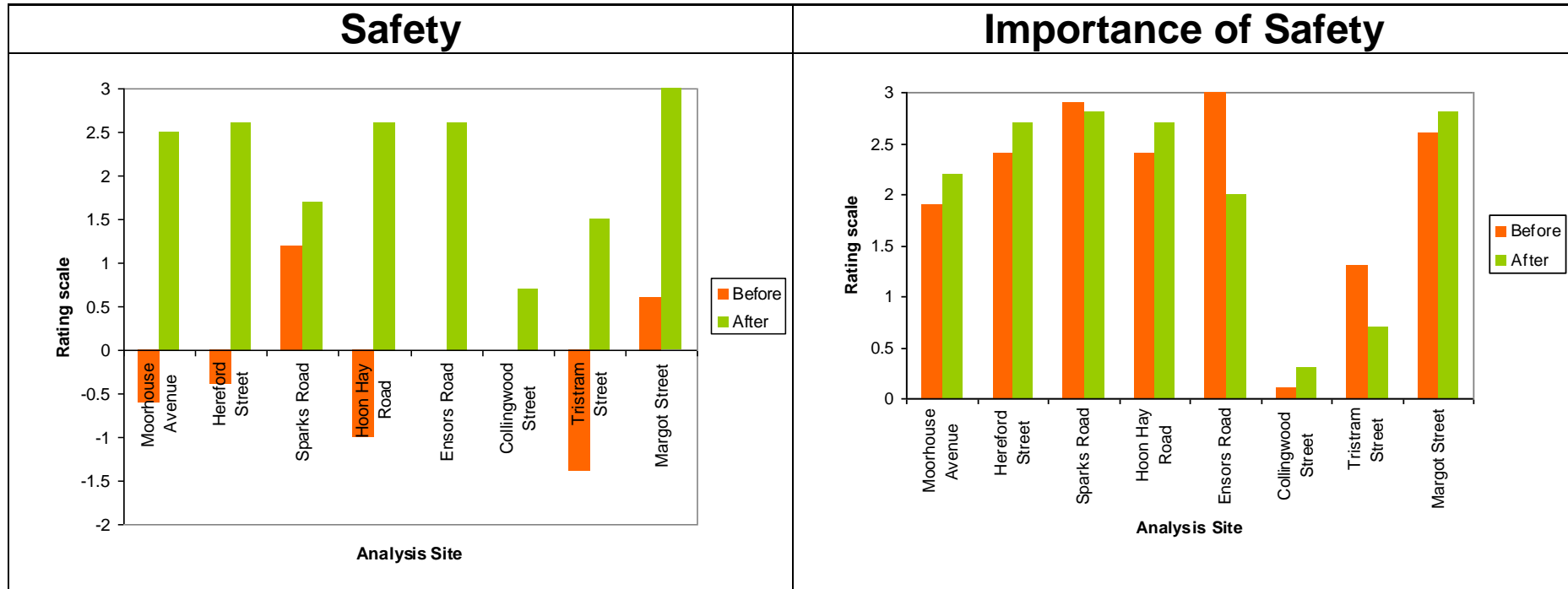


Figure 3: Changes in perceived level of safety and importance of safety

# Perceived Delay

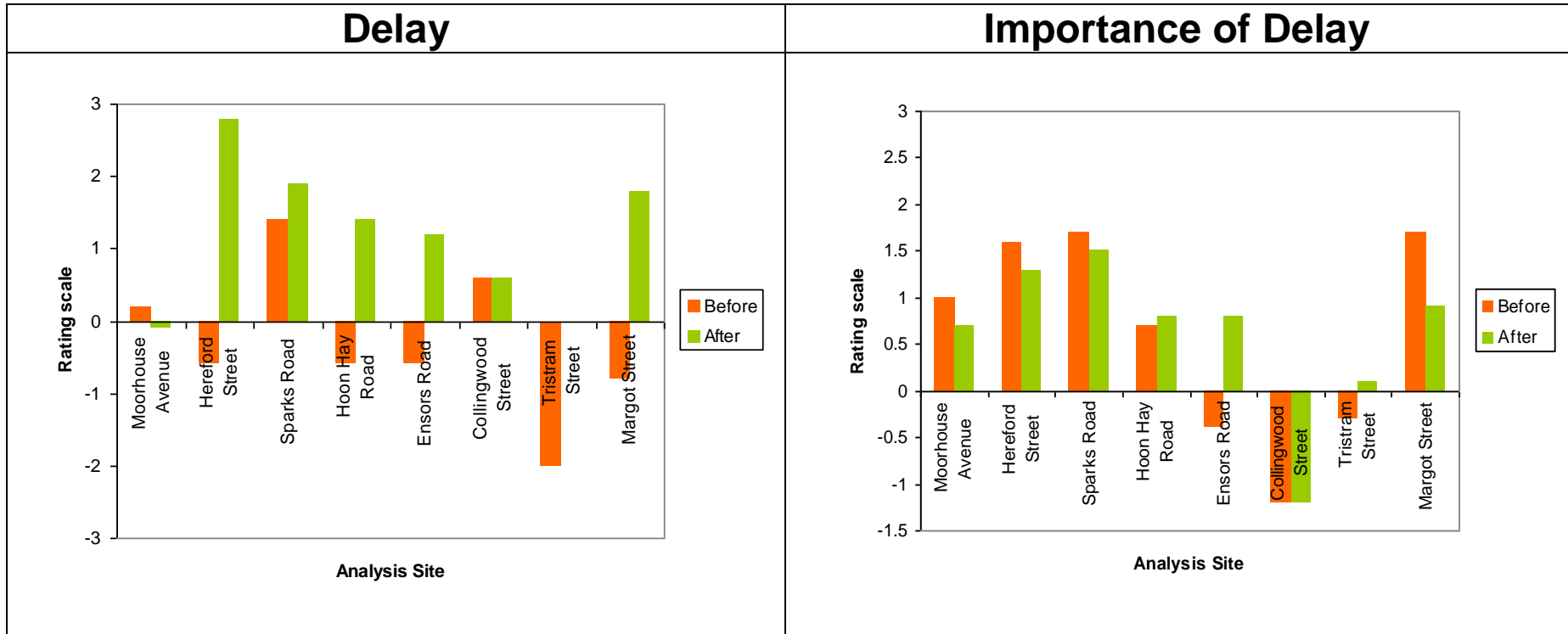


Figure 4: Changes in perceived level of delay and importance of delay

# Perceived Directness

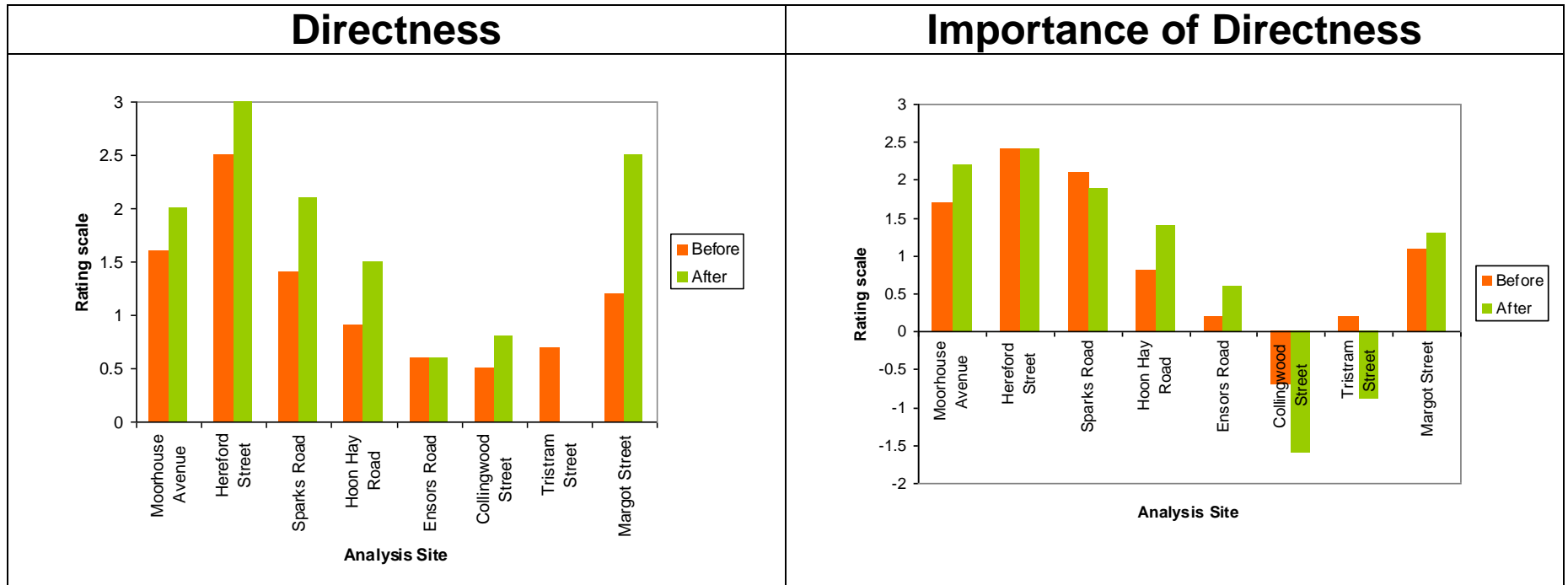


Figure 5: Changes in perceived level of directness and importance of directness



# Conclusion

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- The number of pedestrians crossing at the facility location increased at seven of the eight sites surveyed. This was a combination of pedestrians diverted to the facility from other locations and new pedestrian crossings.
- The perceived safety increased at all eight sites with substantial increases at five sites
- The perceived delays were reduced at six of the eight sites. The importance of delay was found to be similar in the before and after surveys
- At most of the sites directness was considered important – most of the facilities were located on the key desire-lines which resulted in an increase in the after situation
- **A database has been developed to store this data – we would be interested in anyone who is keen to undertake such surveys in the future, so we can build on current number of sites.**

# Questions

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