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transportation consultants

A smarter tool for selecting safe and effective pedestrian crossings

Stacy Rendall
Transportation Researcher

- Research
- The tool

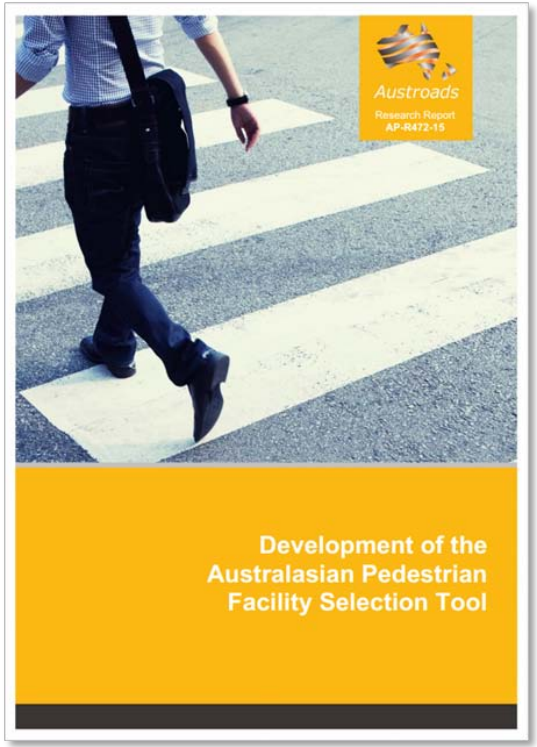
Research

Standardised tool

Assists practitioners in Australia and NZ to select the most appropriate crossing facility

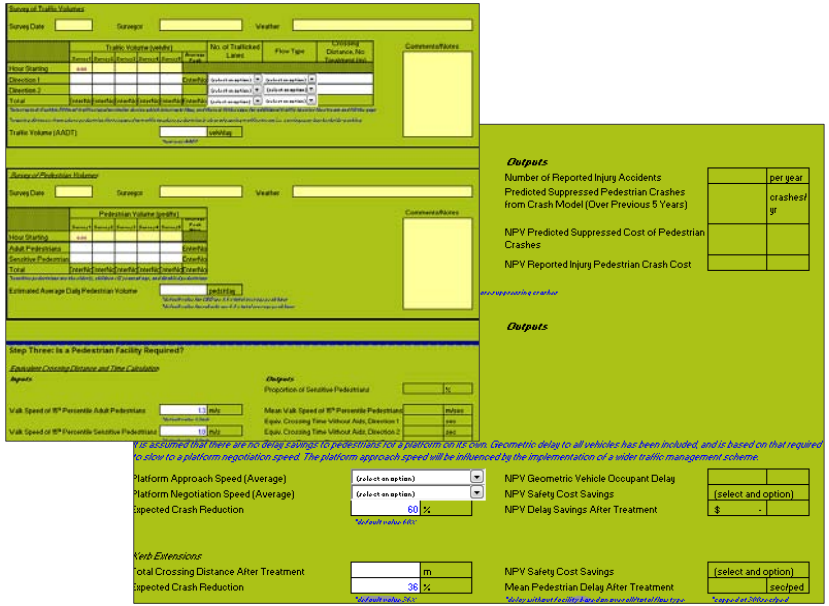
Brings together feasibility criteria, legal frameworks and economic assessment procedures

Includes pedestrian Level of Service assessment

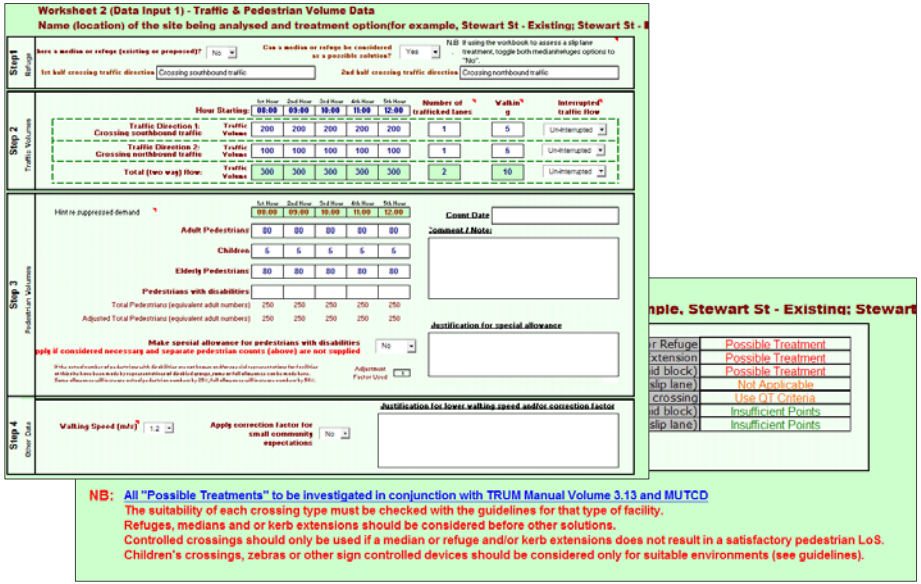


Existing Australasian tools

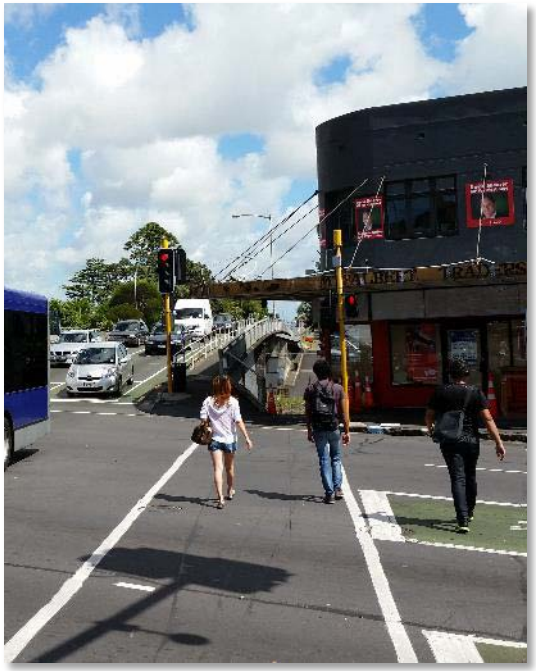
NZ Transport Agency Pedestrian Facility Selection Tool



Queensland Pedestrian Crossing Facility Guidelines and Prioritisation System



New tool



Web based

Easier to use

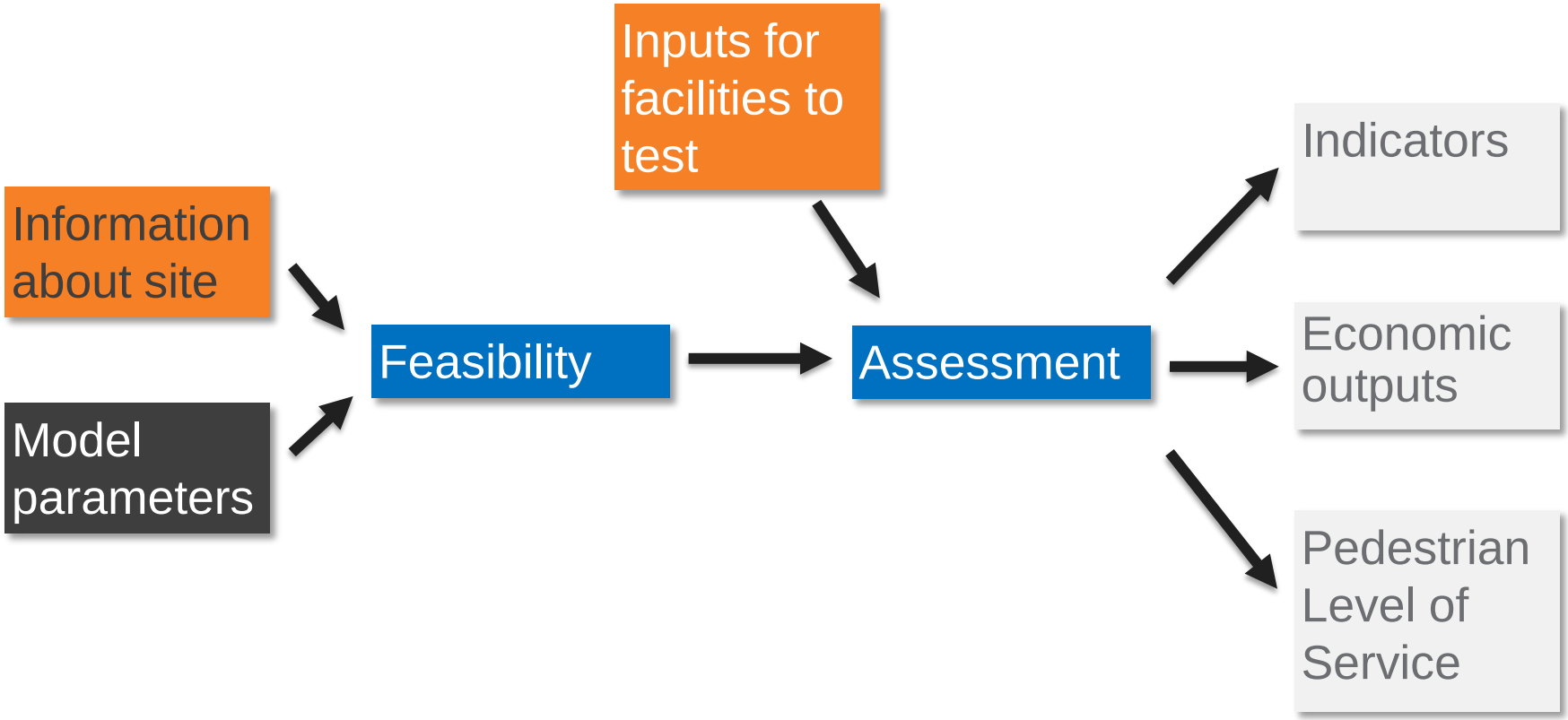
Access from anywhere on any device

All NZ/Australian road authorities have contributed to the tool

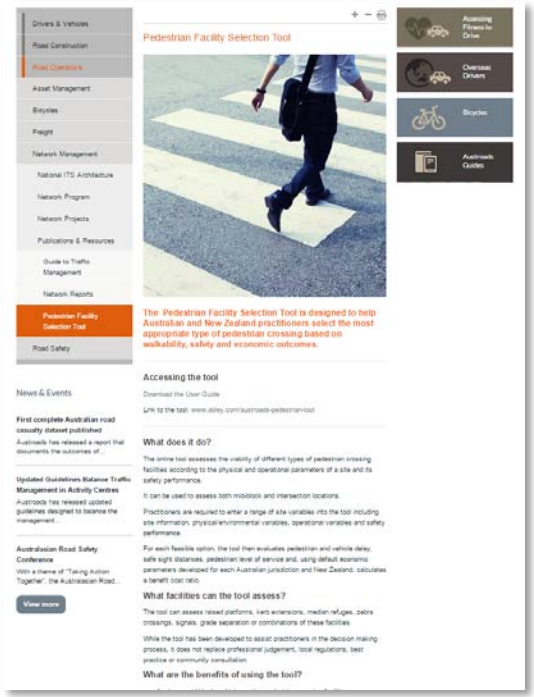
Facilities

Crossing aids	Control type		
	Uncontrolled	Zebra	Signals
None	*Base scenario*	Yes	Yes
Platform	Yes	Yes	
Kerb extensions	Yes	Yes	Yes
Median refuge	Yes	Yes	
Platform and kerb extensions		Yes	
Kerb extensions and median refuge	Yes	Yes	
Grade separation	Yes		

Not designed to assess school crossings


Inputs for facilities to test
Information about site
Model parameters
Feasibility
Assessment
Indicators
Economic outputs
Pedestrian Level of Service

Access



Permanent home page at Austroads

Homepage has links to:

- Tool
- User guide
- Research report
- Support

Short link: bit.ly/austroads_pedestrian

Australasian Pedestrian Crossing Facility Selection Tool

- View help tips by hovering over the help icon (?)
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- Print page

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Project name: Example
Project location: Test location
Option/assessment number: 1
Date of assessment: 23/03/2015

Site information

Jurisdiction: New Zealand
Midblock or intersection? Intersection

Physical/environmental variables

Number of flow directions: 2
Centre treatment: Median
Median width: 2 metres
Parking/shoulder: Yes
Pedestrian visibility: 125 metres

	Direction 1	Direction 2
Flow:	Left to Right	Right to Left
Trafficked lanes:	1	2
Crossing distance:	5.2 metres	11.3 metres

Operational variables

Posted speed limit: 50 km/h
Approach speed (85th percentile): 45 km/h
Traffic volume (AADT): 21000 veh/day
Peak sensitive pedestrian volume: 13 ped/hr
Peak non-sensitive pedestrian volume: 72 ped/hr
Estimated daily pedestrian volume: 595 ped/day
Average vehicle occupancy: 1.1 pers/veh
Degree of pedestrian/turning vehicle conflict: High

	Direction 1	Direction 2
Flow type:	Interrupted	Interrupted
Peak vehicle volume:	1100 veh/hr	1000 veh/hr

Crash information

Use crash model or crash history? Model

Model parameters Show/Hide

Walk speed of average sensitive pedestrians: 1.0 m/s
Walk speed of average non-sensitive pedestrians: 1.2 m/s
Average cost of pedestrian crashes: $ 160000
Value of delay: $ 16.27 /hr
Pedestrian conversion factor: 0.8
Vehicle conversion factor: 0.4

Economic assessment parameters

Evaluation days per annum: 250
Project lifetime: 40 years
Discount rate: 6 %

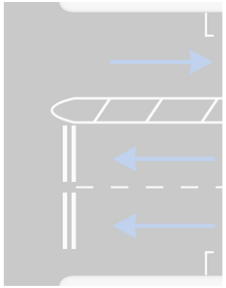
Economic update factors

	Base date	Update factor to current date
Travel time costs/savings	July 2002	1.4
Vehicle operating costs/savings	July 2008	1.06
Crash costs/savings	July 2008	1.22

Expected crash reduction factors

Platform	Kerb extensions	Median refuge	Kerb extensions and median refuge	Zebra only	Zebra with platform	Zebra with kerb extensions	Zebra with platform and kerb extensions	Zebra with median refuge	Zebra with kerb extensions and median refuge	Signals	Signals with kerb extensions	Grade separation
80 %	35 %	15 %	30 %	-28 %	80 %	35 %	80 %	15 %	35 %	45 %	45 %	65 %

Site layout diagram

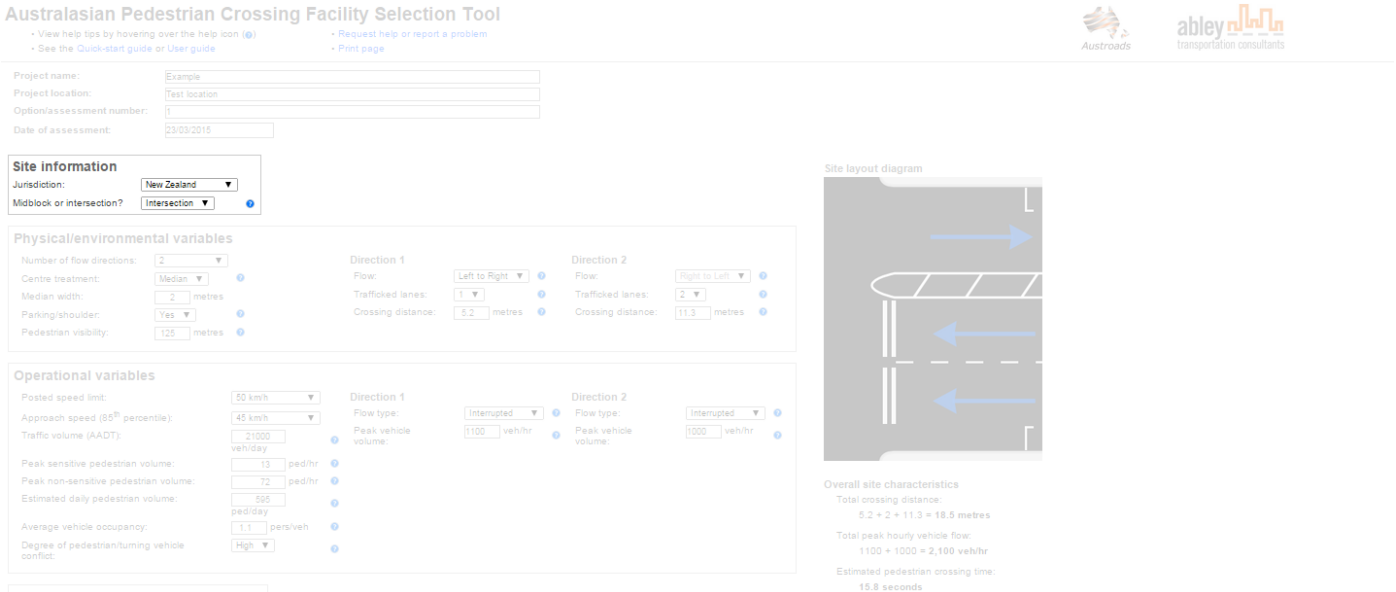


Overall site characteristics

Total crossing distance:
5.2 + 2 + 11.3 = **18.5 metres**

Total peak hourly vehicle flow:
1100 + 1000 = **2,100 veh/hr**

Estimated pedestrian crossing time:
15.8 seconds


Australasian Pedestrian Crossing Facility Selection Tool
• View help tips by hovering over the help icon (?)
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• Request help or report a problem
• Print page
Austroads
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Project name:
Example
Project location:
Test location
Option/assessment number:
1
Date of assessment:
23/03/2015
Site information
Jurisdiction:
New Zealand
Midblock or intersection?
Intersection
Site layout diagram
Physical/environmental variables
Number of flow directions:
2
Centre treatment:
Median
Median width:
2
metres
Parking/shoulder:
Yes
Pedestrian visibility:
125
metres
Direction 1
Flow:
Left to Right
Trafficked lanes:
1
Crossing distance:
5.2
metres
Direction 2
Flow:
Right to Left
Trafficked lanes:
2
Crossing distance:
11.3
metres
Operational variables
Posted speed limit:
50 km/h
Approach speed (85th percentile):
45 km/h
Traffic volume (AADT):
21000
veh/day
Peak sensitive pedestrian volume:
13
ped/hr
Peak non-sensitive pedestrian volume:
72
ped/hr
Estimated daily pedestrian volume:
595
ped/day
Average vehicle occupancy:
1.1
pers/veh
Degree of pedestrian/turning vehicle conflict:
High
Direction 1
Flow type:
Interrupted
Peak vehicle volume:
1100
veh/hr
Direction 2
Flow type:
Interrupted
Peak vehicle volume:
1000
veh/hr
Overall site characteristics
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5.2 + 2 + 11.3 = 18.5 metres
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Model
Model parameters
Show/Hide
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Discount rate:
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Economic update factors
Base date
Update factor to current date
Travel time costs/savings
July 2002
1.4
Vehicle operating costs/savings
July 2008
1.06
Crash costs/savings
July 2006
1.22
Expected crash reduction factors
Platform
80 %
Kerb extensions
35 %
Median refuge
15 %
Kerb extensions and median refuge
30 %
Zebra only
-28 %
Zebra with platform
80 %
Zebra with kerb extensions
35 %
Zebra with platform and kerb extensions
80 %
Zebra with median refuge
15 %
Zebra with kerb extensions and median refuge
35 %
Signals
45 %
Signals with kerb extensions
45 %
Grade separation
65 %

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Physical/environmental variables

Number of flow directions: 2
Centre treatment: Median
Median width: 2 metres
Parking/shoulder: Yes
Pedestrian visibility: 125 metres

Direction 1		Direction 2	
Flow:	Left to Right	Flow:	Right to Left
Trafficked lanes:	1	Trafficked lanes:	2
Crossing distance:	5.2 metres	Crossing distance:	11.3 metres

Operational variables

Posted speed limit: 50 km/h
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Degree of pedestrian/turning vehicle conflict: High

Direction 1		Direction 2	
Flow type:	Interrupted	Flow type:	Interrupted
Peak vehicle volume:	1100 veh/hr	Peak vehicle volume:	1000 veh/hr

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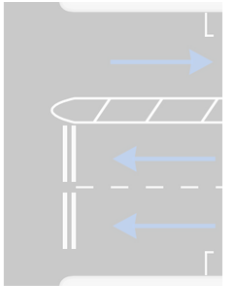
Site layout diagram



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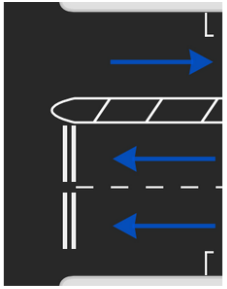

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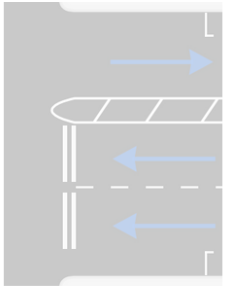

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Flow type:	Interrupted	Interrupted
Peak vehicle volume:	1100 veh/hr	1000 veh/hr

Crash information

Use crash model or crash history? Model

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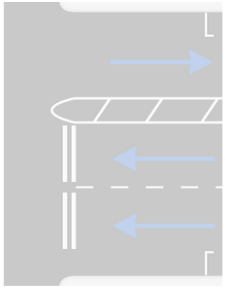

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15.8 seconds

Model parameters Show/Hide

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Walk speed of average non-sensitive pedestrians: 1.2 m/s
Average cost of pedestrian crashes: $ 160000
Value of delay: $ 16.27 /hr
Pedestrian conversion factor: 0.6
Vehicle conversion factor: 0.4

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Feasible facilities

	Suitable for site?	Built parameters	Construction cost	Show in final output? Select all/none/feasible
Platform	No	Vehicle negotiation speed: Please select...	$	☐
Kerb extensions	Yes	Total crossing distance after treatment: metres	$	☑
Median refuge	Yes	Direction 1 crossing distance after treatment: metres Median refuge width: metres Direction 2 crossing distance after treatment: metres	$	☑
Kerb extensions and median refuge	Yes	Direction 1 crossing distance after treatment: metres Median refuge width: metres Direction 2 crossing distance after treatment: metres	$	☑
Zebra only	No	*No parameters*	$	☐
Zebra with platform	No	*Applies vehicle negotiation speed from **Platform** above*	$	☐
Zebra with kerb extensions	No	*Applies total crossing distance from **Kerb extensions** above*	$	☐
Zebra with platform and kerb extensions	No	*Applies vehicle negotiation speed from **Platform** and total crossing distance from **Kerb extensions** above*	$	☐
Zebra with median refuge	No	*Applies distances and refuge width from **Median refuge** above*	$	☐
Zebra with kerb extensions and median refuge	No	*Applies distances and refuge width from **Kerb extensions and median refuge** above*	$	☐
Signals	Yes	Cycle time: seconds Percent of time in green pedestrian phase: %	$	☑
Signals with kerb extensions	Yes	*Applies parameters from **Signals** and total crossing distance from **Kerb extensions** above*	$	☑
Grade separation	No	*N/a*	$	☐

Feasible facilities

	Suitable for site?	Built parameters	Construction cost	Show in final output? Select all/none/feasible
Platform	No	Vehicle negotiation speed: Please select... ▾	$	☑
Kerb extensions	Yes	Total crossing distance after treatment: 17.5 metres	$ 75000	☑
Median refuge	Yes	Direction 1 crossing distance after treatment: 5.2 metres Median refuge width: 2 metres Direction 2 crossing distance after treatment: 11.3 metres	$ 85000	☑
Kerb extensions and median refuge	Yes	Direction 1 crossing distance after treatment: 4.7 metres Median refuge width: 2 metres Direction 2 crossing distance after treatment: 10.8 metres	$ 95000	☑
Zebra only	No	*No parameters*	$	☑
Zebra with platform	No	*Applies vehicle negotiation speed from **Platform** above*	$	☐
Zebra with kerb extensions	No	*Applies total crossing distance from **Kerb extensions** above*	$	☐
Zebra with platform and kerb extensions	No	*Applies vehicle negotiation speed from **Platform** and total crossing distance from **Kerb extensions** above*	$	☐
Zebra with median refuge	No	*Applies distances and refuge width from **Median refuge** above*	$	☐
Zebra with kerb extensions and median refuge	No	*Applies distances and refuge width from **Kerb extensions and median refuge** above*	$	☐
Signals	Yes	Cycle time: 180 seconds Percent of time in green pedestrian phase: 8 %	$ 120000	☑
Signals with kerb extensions	Yes	*Applies parameters from **Signals** and total crossing distance from **Kerb extensions** above*	$ 140000	☑
Grade separation	No	*N/a*	$	☐

Facility assessment

	Suitable for site?	Pedestrian delay	Vehicle delay	Predicted crash rate	CSD	ASD	SISD
No facility		85 sec	0 sec	0.08 /year	231 m	41 m	78 m
Platform	No						
Kerb extensions	Yes	72 sec	0 sec	0.05 /year	219 m	41 m	78 m
Median refuge	Yes	36 sec	0 sec	0.07 /year	141 m	41 m	78 m
Kerb extensions and median refuge	Yes	32 sec	0 sec	0.06 /year	135 m	41 m	78 m
Zebra only	No						
Signals	Yes	77 sec	0 sec	0.04 /year	231 m	41 m	78 m
Signals with kerb extensions	Yes	77 sec	0 sec	0.04 /year	219 m	41 m	78 m

	Perceived delay	Perceived safety	Pedestrian LOS	Pedestrian delay cost	Pedestrian delay saving	Vehicle delay cost	Crash cost	Safety saving	Total benefits	BCR
No facility	F	F	F	$ 746,000			$ 239,000			
Platform										
Kerb extensions	F	F	F	$ 632,000	$ 114,000	$ 0	$ 156,000	$ 84,000	$ 198,000	2.6
Median refuge	E	F	F	$ 317,000	$ 429,000	$ 0	$ 203,000	$ 36,000	$ 465,000	5.5
Kerb extensions and median refuge	D	E	E	$ 281,000	$ 465,000	$ 0	$ 168,000	$ 72,000	$ 537,000	5.7
Zebra only										
Signals	D	B	B	$ 670,000	$ 76,000	$ 0	$ 132,000	$ 108,000	$ 183,000	1.5
Signals with kerb extensions	D	B	B	$ 670,000	$ 76,000	$ 0	$ 132,000	$ 108,000	$ 183,000	1.3

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Kerb extensions and median refuge	Yes	32 sec	0 sec	0.06 /year	135 m	41 m	78 m
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Signals with kerb extensions	Yes	77 sec	0 sec	0.04 /year	219 m	41 m	78 m

	Perceived delay	Perceived safety	Pedestrian LOS	Pedestrian delay cost	Pedestrian delay saving	Vehicle delay cost	Crash cost	Safety saving	Total benefits	BCR
No facility	F	F	F	$ 746,000			$ 239,000			
Platform										
Kerb extensions	F	F	F	$ 632,000	$ 114,000	$ 0	$ 156,000	$ 84,000	$ 198,000	2.6
Median refuge	E	F	F	$ 317,000	$ 429,000	$ 0	$ 203,000	$ 36,000	$ 465,000	5.5
Kerb extensions and median refuge	D	E	E	$ 281,000	$ 465,000	$ 0	$ 168,000	$ 72,000	$ 537,000	5.7
Zebra only										
Signals	D	B	B	$ 670,000	$ 76,000	$ 0	$ 132,000	$ 108,000	$ 183,000	1.5
Signals with kerb extensions	D	B	B	$ 670,000	$ 76,000	$ 0	$ 132,000	$ 108,000	$ 183,000	1.3

Conclusions

Does the “grunt work” of assessing crossings

Standardised: Australia and NZ

Supports best practice

Makes it easier for planners, designers and engineers to balance competing demands and select the right facility

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