

Cheddar Road Pedestrian Crossing Facilities

Background and Strategic Need

Cheddar Road between Broadway and Hickford Street provides a supervised school crossing 5 metres south of Hickford Street, and a number of midblock crossing points with kerb ramps at most side streets to assist pedestrians crossing to and from the central median.

Council's Safe Travel Strategy includes an action to *provide safe road crossing points*. The upgrade of existing crossing points or providing additional crossing points on Cheddar Road would assist in achieving this objective.

Council is currently preparing the Darebin Walking Strategy and has mapped Darebin's Principle Pedestrian Network (PPN) to better understand pedestrian movements and future trends of walking activity. A PPN is a designated network of routes in a given area which support walking trips into and around key destinations such as activity centres, schools, and transport nodes. The PPN will inform the Darebin Walking Strategy and assist council in identifying gaps in the network, physical barriers to walking, prioritising works and setting a long term plan for the infrastructure and operational requirements to support people walking in Darebin. This will include identifying those sites where the PPN intersects with roads that carry high levels of traffic and prioritise the provision of suitable road crossing facilities.

The PPN identifies the route from Ruthven Railway Station to Cheddar Road along Purinuan Road as a Primary Pedestrian Route. On-site investigations have identified, Crookston Road as an alternative pedestrian route from Ruthven Station to Cheddar Road. Hickford Street is identified as a Secondary Pedestrian Route. Refer to Figure 1 for the PPN routes for the Cheddar Road area.

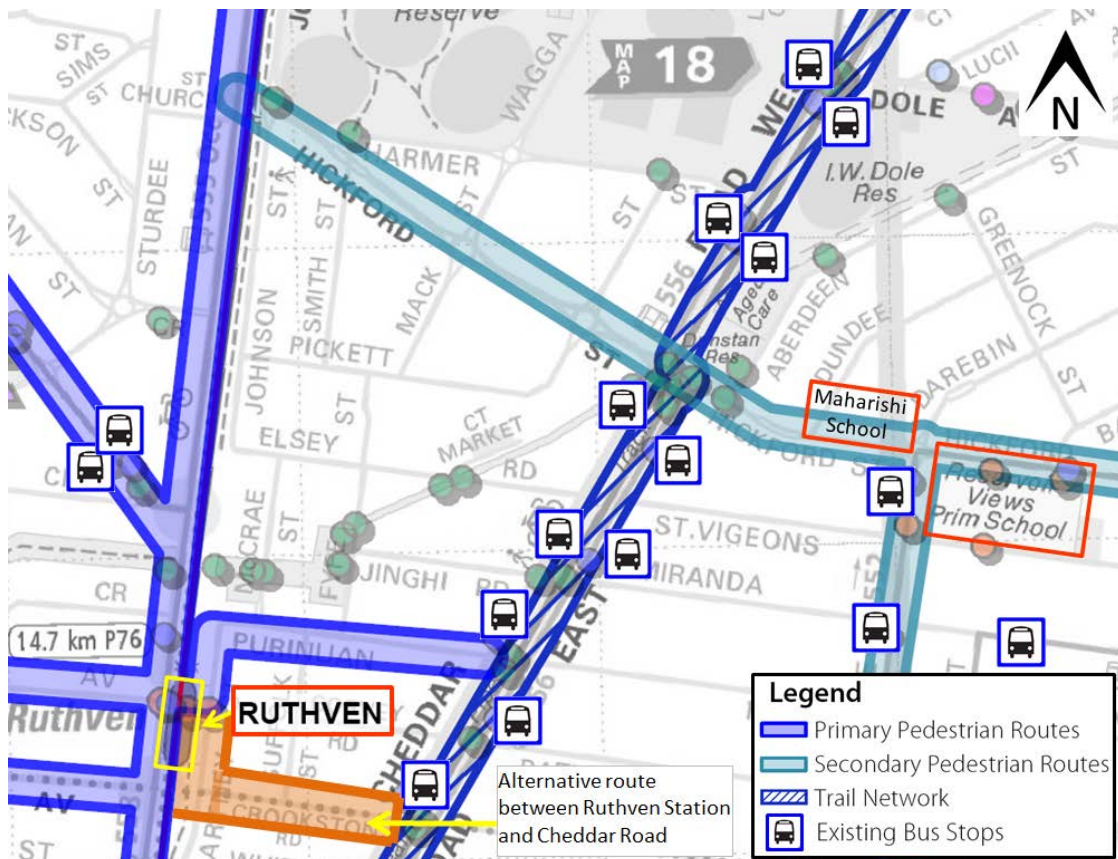


Figure 2: PPN routes in the vicinity of Cheddar Road

A review of the most recent available crash data for the past five years revealed that there have not been any casualty crashes involving pedestrians crossing Cheddar Road between Hickford Street and Broadway during that time. Therefore, crash patterns will not inform the location on Cheddar Road that may be prioritised for new or upgraded crossing facilities.

Pedestrian crossing facilities at two locations on Cheddar Road, near Hickford Street, and midway between Hickford Street and Broadway are considered in the next two sections of this report. It is to be noted that as Cheddar Road is a Council managed road without a history of collisions involving pedestrians, any modifications or new crossing facilities would need to be funded by Council.

Pedestrians Crossing Cheddar Road near Hickford Street

Background

There is an existing two leg supervised school crossing on Cheddar Road near Hickford Street to assist students and parents of Maharishi School and Reservoir Views Primary School to cross Cheddar Road. The crossing in this location is also used by other pedestrians and cyclists to access the Cheddar Road Shared Path from both sides of Cheddar Road. The central median of Cheddar Road allows pedestrians to cross one lane of traffic at a time, which is safer and more convenient than crossing two lanes.

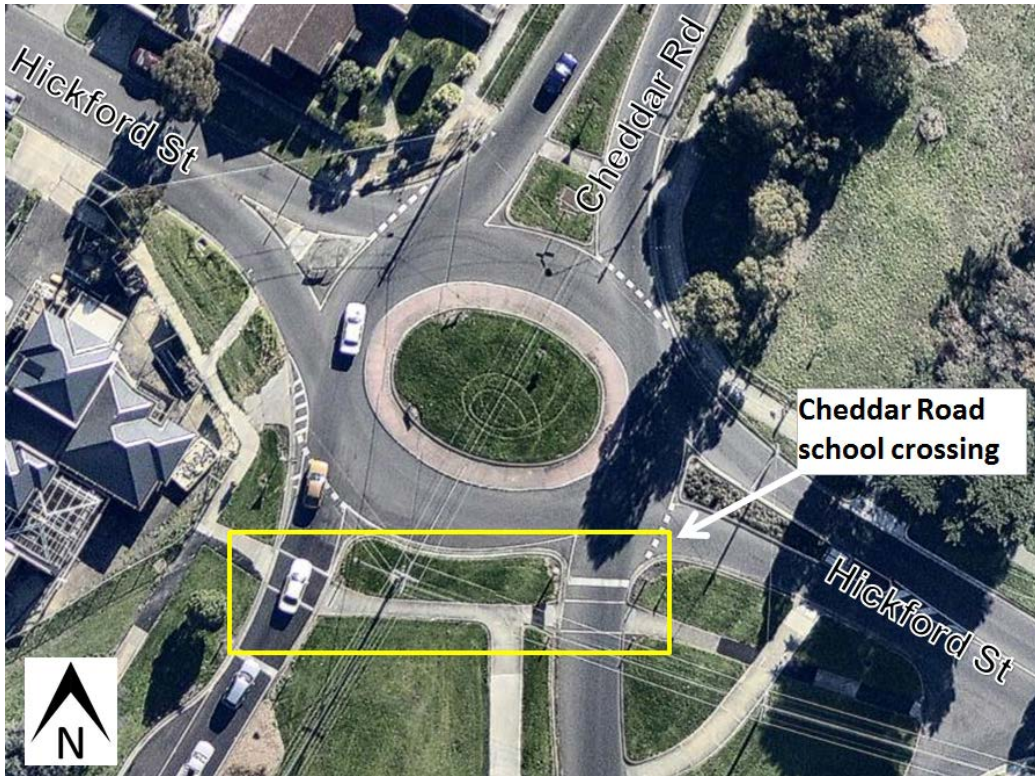


Figure 2: Cheddar Road school crossing



Figure 3: Cheddar Road school crossing (northbound)



Figure 4: Cheddar Road school crossing (southbound)

Previous work completed considering safety

A Travel to School Audit was carried out for Reservoir Views Primary School in May 2012. The purpose of the audit was to identify any safety issues or other issues that may discourage children from walking or riding to school. The audit found Cheddar Road is one of the key walking to school routes and identified needing to cross Cheddar Road as a potential barrier for children who live to the west of Cheddar Road to walk to school.

The audit recommended improving the roundabout at Hickford Street and Cheddar Road for pedestrians (not just school children) and suggested potential treatment options such as a raised school crossing, a pedestrian 'zebra' crossing, Pedestrian Operated Signals or signalisation of the whole intersection. However, it was beyond the scope of the audit to consider the suitability of the recommended treatment, the priority of treating this location compared to other schools and pedestrian areas within Darebin, the cost of treatments, funding method of each treatment or the number of students crossing at this location. The recommendations of the audit were assessed and none of the suggested treatments were considered warranted or appropriate as summarised below:

- Raised school crossing
 - There is a low number of students using the crossing relative to other schools and locations, including locations which are yet to have a school crossing installed.
 - Traffic management devices such as speed humps or raised crossings are generally not suited to roads with bus routes or high traffic volumes such as Cheddar Road.
 - Most vehicles are already travelling slowly due to the proximity of the crossing to the roundabout.
 - There have not been any recorded casualty crashes involving pedestrians crossing Cheddar Road at this location.

- Pedestrian 'zebra' crossing and Pedestrian Operated Signals are not considered to be warranted using VicRoads Traffic Engineering Manual, as discussed in detail later in this section.
- Signalising the entire intersection:
 - Signalising the entire intersection would come at a substantial cost and would be unlikely to benefit a significant number of pedestrians as it is not particularly highly used crossing point.
 - Most vehicles are already travelling slowly due to the proximity of the crossing to the roundabout.
 - Pedestrians are currently only required to cross one lane of traffic at a time which already reduces the risk to pedestrians.
 - There have not been any casualty crashes recorded in the latest five years of available data involving pedestrians crossing Cheddar Road at this location. There have been four recorded vehicle casualty crashes in the same period, with further investigation required to determine whether signalisation of the intersection would have assisted in avoiding these crashes.

A safety audit was also undertaken of the northern section of the Great Northern Bikeway Shared Path (between Tunaley Parade, Reservoir and Murray Road, Preston) in 2014/2015, which included the Cheddar Road Shared Path. The audit did not identify any safety issues associated with path users crossing to/from the median of Cheddar Road to/from the eastern side of Cheddar Road, as only one Cheddar Road traffic lane must be crossed and generally vehicles are travelling relatively slowly on their departure from the roundabout.

Assessment of existing crossing

Pedestrian counts were carried out at the school crossing during school start and finish time in June 2015 to quantify the number of pedestrians using the crossing. The results from the counts are summarised in Table 1 on the following page.

Morning					Afternoon				
Time	Adults	Children	N/B veh	S/B veh	Time	Adults	Children	N/B veh	S/B veh
8:15- 8:30	0	1	101	252	3:00- 3:15	3	1	174	190
8:30- 8:45	4	3	120	249	3:15- 3:30	5	2	181	185
8:45- 9:00	6	3	127	211	3:30- 3:45	6	8	181	151
9:00- 9:15	2	1	120	167	3:45- 4:00	2	0	181	141
Total	12	8	468	879	Total	16	11	717	667
	20		1347			27		1384	

Table 1: Cheddar Road school crossing pedestrian and vehicle data

Observations during counts:

- There was only one child that crossed while not accompanied by an adult in the each of the morning and afternoon counts. On both occasions the child was in their late years of high school.
- Many of the adults that crossed were pedestrians and cyclists going to/from the Cheddar Road Shared Path to/from either side of Cheddar Road rather than to Maharishi School or Reservoir Views Primary School. These pedestrians and cyclists did not necessarily need the school crossing to cross Cheddar Road safely as there tends to be gaps in the Cheddar Road traffic flow which enables crossing.
- The number of children using the crossing is increased by children younger than primary school age who are accompanying their parent to pick up/ drop off a sibling at the school then use the crossing again when returning in the opposite direction later within the crossing time of operation.
- The times that the counts were conducted are most likely the peak time for pedestrian movements including school children and parents, people walking home from work and people walking and cycling for recreation on the Cheddar Road Shared Path.
- The crossing appears to operate safely with the crossing supervisor waiting for a suitable gap in the traffic before stepping onto the road, ensuring that they have been noticed by drivers and vehicles have stopped before allowing pedestrians to cross the road.

- Vehicles are generally travelling reasonably slowly on the approach to the roundabout which assists with safety and reduces the braking distance required for vehicles to stop once the supervisor steps on to the road.
- Pedestrians are only required to cross one traffic lane at a time which is safer and more convenient than crossing two lanes.

Assessment of potential upgrade of crossing facilities

The Council Resolution requests the investigation of a more prominent crossing facility. VicRoads supplement to Austroads Guide to Traffic Management Part 6 (Intersections, Interchanges and Crossings) provides general guidelines for various pedestrian road crossing facilities, each of which are considered below. Each of the treatments are classified as Major Traffic Control Devices and as such require the approval of VicRoads to permit installation.

The times that the school crossing counts were conducted are most likely the peak time for pedestrian movements including school children and parents, people walking home from work and people walking and cycling for recreation on the Cheddar Road Shared Path. Therefore, the pedestrian and traffic volumes recorded during the survey at the school crossing (refer to Table 1) were used for assessing the different types of potential pedestrian facilities.

Pedestrian 'zebra' crossing without flashing lights

General guidelines for Pedestrian 'zebra' Crossings are as follows:

- Pedestrian volumes of 20 or more per hour, and
- Vehicle volumes of 200 or more per hour, and
- Speed limit of 50 km/h or less.
- Not suitable for crossing more than one lane in each direction in one movement.

Cheddar Road meets the required pedestrian and vehicle volumes for a 'zebra' crossing without flashing lights. This treatment is not typically suited to high volume roads such as Cheddar Road or speed limits above 50km/h. However, if Cheddar Road had a speed limit of 50km/h, given that vehicles are generally travelling reasonably slowly in the vicinity of the roundabout, a 'zebra' crossing may be suitable in this location.

As discussed in the Council report and Appendix A, it is proposed to submit an application to VicRoads to reduce the speed limit on Cheddar Road to 50 km/h. If the application is successful, Cheddar Road will have a suitable speed limit for a 'zebra' crossing and it is proposed to commission an independent safety assessment of a potential 'zebra' crossing at this location. If the findings of the safety assessment are satisfactory, an application will be submitted to VicRoads for the upgrade of the existing school crossing to a 'zebra' crossing. If approved, construction of the 'zebra' crossing will be referred to future Council funding programs.

Pedestrian 'zebra' Crossing with flashing lights

General warrants for Pedestrian 'zebra' Crossing with flashing lights are as follows:

- Pedestrian volumes of 60 or more per hour, and
- Vehicle volumes of 500 or more per hour.
- Suitable for lower traffic speeds and frequent pedestrian movements.
- Not suitable for crossing more than one lane in each direction in one movement.

Cheddar Road does not have the required number of pedestrians to warrant a zebra crossing with flashing lights.

Pedestrian Operated Signals

General warrants for Pedestrian Operated Signals are as follows:

- Pedestrian volumes of 100 or more per hour, and
- Vehicle volumes of 500 or more per hour per carriageway.
- May be considered where a pedestrian 'zebra' crossing is warranted but not appropriate.
- Where there have been two or more pedestrian casualty crashes in the last 3 years.

While Cheddar Road meets the required vehicle volumes, it does not meet the required number of pedestrians. Notwithstanding, Pedestrian Operated Signals can be a suitable treatment where pedestrian 'zebra' crossings are warranted but not appropriate for a particular location. However, there is a relatively low number of pedestrians crossing Cheddar Road in this location and signals may not provide sufficient benefit to justify the capital cost of installing the signals. In addition, there have not been any pedestrian casualty crashes at the location in the past five years of available data.

Where the crossing is primarily intended for use by school children, pedestrian operated signals may be appropriate where:

- The number of children crossing the road exceeds 50 per hour; and
- The number of vehicles exceeds 500 per hour; and
- Product of children multiplied by vehicles 25,000 or more for primary school children.

Cheddar Road doesn't meet the number of children or the product of children multiplied by vehicles ($11 \times 1384 = 15,224$) for pedestrian operated signals intended for use of school children. On this basis, pedestrian operated signals are not recommended at this location.

Visibility of crossing

As an interim measure prior to the submission of applications for a 50km/h speed limit and 'zebra' crossing, the visibility of the crossing has been reviewed as per the Council Resolution, with the following improvements identified to assist in improving the conspicuity of the crossing:

- Upgrade existing warning signage on each approach to the crossing by replacing the orange signs with fluoro yellow signs.
- Replace the short flag-holding red and white school crossing post at the northbound crossing with a 1.8 metre post as per VicRoads standards.
- Reinstate a missing red and white school crossing post at the northbound crossing.
- Repaint all existing red and white school crossing posts.
- Repaint the school crossing linemarking.

Recommendation

Based on the above assessments, it is recommended that applications be submitted to VicRoads for a reduction of the Cheddar Road speed limit to 50km/h and the upgrade of the existing school crossing to a 'zebra' crossing, subject to the outcome of an independent safety assessment.

In the interim it is recommended that upgrade works are carried out to improve the visibility of the school crossing.

Pedestrians Crossing Cheddar Road midway between Hickford Street and Broadway

Pedestrian facilities in the form of paths and kerb ramps are provided at most side streets along Cheddar Road between Broadway and Hickford Street.

To assist in assessing the need for formalised pedestrian crossing facilities for Cheddar Road, vehicle and pedestrian surveys were conducted at Purinuan Road and Crookston Road. The data was collected for a 12 hour period between 7am and 7pm on a weekday in July 2015 and included the northbound and southbound lanes of Cheddar Road and the number of pedestrians crossing at the two locations along Cheddar Road. The locations were selected based on Purinuan Road being identified as a Primary Pedestrian Route in the PPN (refer to Figure 1 above), and Crookston Road as a potential alternative route between Ruthven Station and Cheddar Road.

VicRoads guidelines state that each elderly pedestrian and unaccompanied child are to be counted as two pedestrians. The results for each location for the 12 hour period are summarised in Table 2 and 3 below with the increased number of pedestrians accounting for elderly and children indicated in brackets:

Period	Pedestrians crossing Cheddar Rd northbound lanes near Crookston Rd	Northbound vehicles	Pedestrians crossing Cheddar Rd southbound lanes near Crookston Rd	Southbound vehicles
7:00-19:00	114 (133 with elderly and unaccompanied children counted as two pedestrians)	7,211	75 (86 with elderly and unaccompanied children counted as two pedestrians)	9,929
Pedestrian AM peak hour	18 (21)	402	14 (16)	1,151
Pedestrian PM peak hour	14 (17)	814	11 (14)	780

Table 2: Cheddar Road at Crookston Road pedestrian and vehicle data

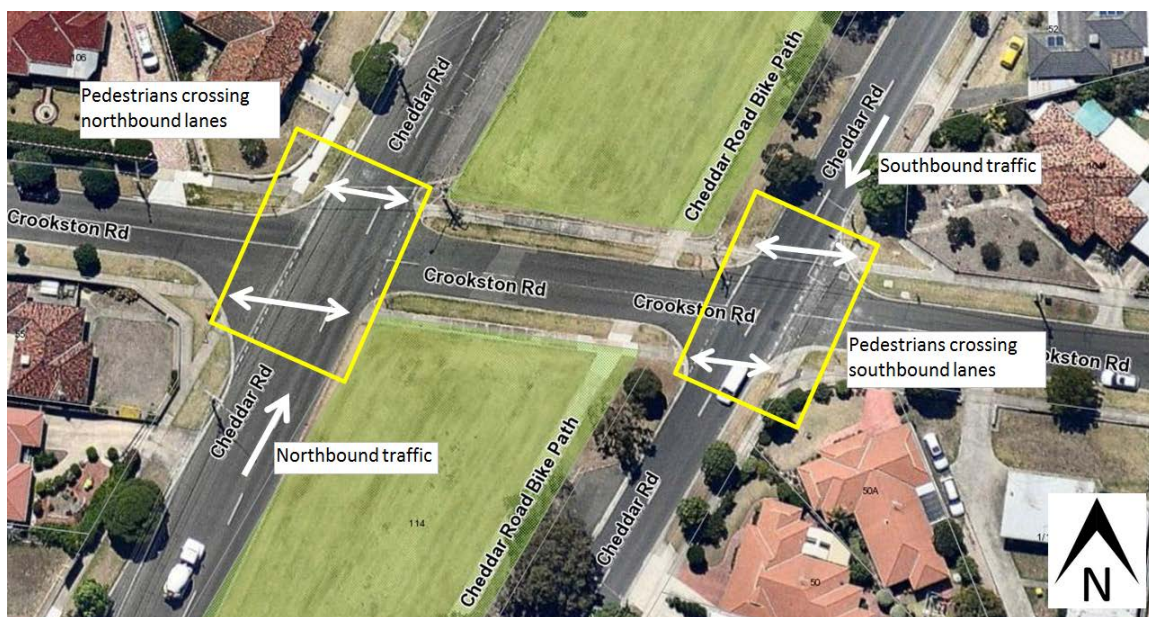


Figure 5: Pedestrian movements at Cheddar Road and Crookston Road

Period	Pedestrians crossing Cheddar Rd northbound lanes near Purinuan Rd	Northbound vehicles	Pedestrians crossing Cheddar Rd southbound lanes near Purinuan Rd	Southbound vehicles
7:00-19:00	111 (132 with elderly and children counted as two pedestrians)	7,211	86 (99 with elderly and children counted as two pedestrians)	9,929
Pedestrian AM peak hour	19 (24)	436	20 (27)	1,255
Pedestrian PM peak hour	19 (23)	507	13 (15)	716

Table 3: Cheddar Road at Purinuan Road pedestrian and vehicle data

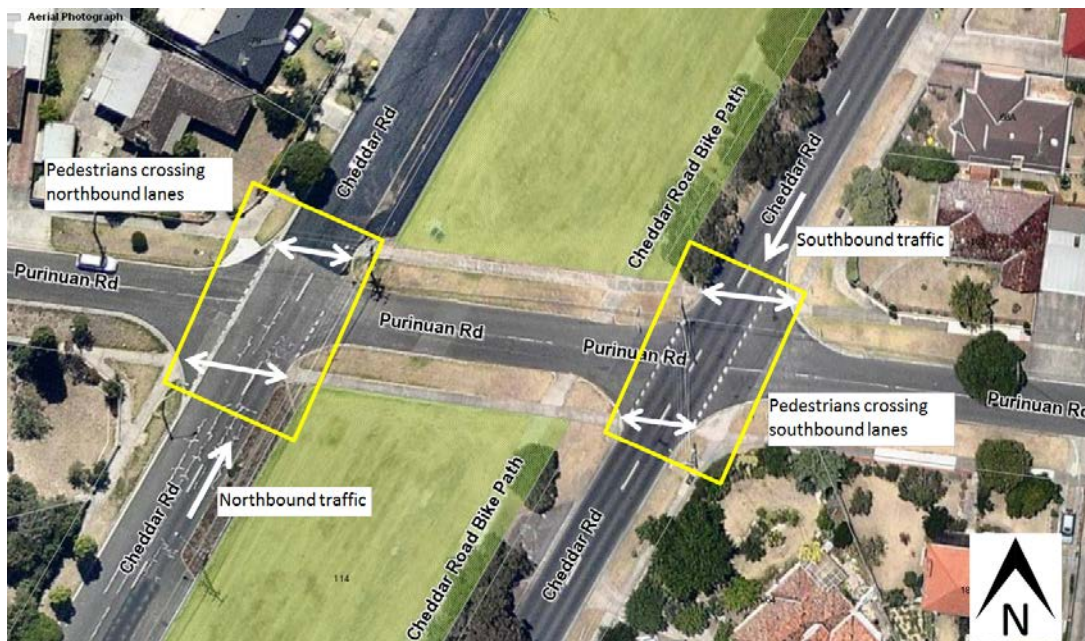


Figure 6: Pedestrian movements at Cheddar Road and Purinuan Road

The results in Tables 2 and 3 above were used to assess the various types of pedestrian crossing facilities, each of which are discussed below.

Pedestrian 'zebra' crossing without flashing lights:

The peak pedestrian movements across Cheddar Road at Purinuan Road and Crookston Road meet the required pedestrian volumes for a pedestrian 'zebra' crossing without flashing lights. However, the current speed limit of Cheddar Road is above the suitable speed limit for this treatment and a zebra crossing is not an appropriate treatment for crossing multiple lanes of traffic in one movement (even if the speed limit on Cheddar Road is successfully reduced to 50 km/h).

Consideration could potentially be given to reducing Cheddar Road between Hickford Street and Broadway to one traffic lane in each direction, resulting in pedestrians only needing to cross one lane at a time and Cheddar Road being easier to cross, thereby creating an environment may be suited to a 'zebra' crossing.

Pedestrian 'zebra' crossing with flashing lights:

The peak pedestrian volumes at Purinuan and Crookston Roads do not meet the warrants for a pedestrian crossing with flashing lights. In addition, pedestrian crossings with flashing lights should only be implemented where traffic speeds are lower, where pedestrians using the crossing would not be unexpected or infrequent such as within a shopping precinct and are not a suitable treatment for crossing multiple lanes of traffic in one movement.

Pedestrian Operated Signals:

The peak pedestrian volumes at Purinuan and Crookston Roads do not meet the warrants for Pedestrian Operated Signals. However, Pedestrian Operated Signals can be a suitable treatment where pedestrian 'zebra' crossings are warranted but not appropriate. Therefore, traffic signals could be considered at a location of Cheddar Road.

To minimise conflict points with vehicles and maximise safety, Pedestrian Operated Signals would have to be arranged in a 'dog leg' manner (refer to Figure 7 below). This is not considered an acceptable outcome for pedestrians, and therefore the entire intersection would need to be signalised, resulting in significant financial requirements for Council.



Figure 7: Required 'dog leg' arrangement of Pedestrian Operated Signals at Cheddar Road and a side road

Given that there is a relatively low number of pedestrians crossing Cheddar Road at midblock locations, and there have not been any pedestrian casualty crashes at the location in the past five years of available data, traffic signals are not considered to be warranted, and may not provide sufficient benefit to justify the capital cost of installing the signals.

Recommendation

Based on the above, it is recommended that no formalised pedestrian crossing be implemented for Cheddar Road between Hickford Street and Broadway at this time. The number of pedestrians crossing Cheddar Road at Purinuan Road should be monitored and the adequacy of crossing facilities reviewed and further considered through the development of the Darebin Walking Strategy.