CHAPTER 4: PEDESTRIAN AND PEDAL CYCLIST SIGNALS

4.1 INTRODUCTION

1 Pedestrian and pedal cyclist traffic is subject to control by any traffic signal that is intended for vehicular traffic. Separate signals, however, can be provided for the control of pedestrians and pedal cyclists.

2 Pedestrian and pedal cyclist signals SHALL be operated only in conjunction with vehicular traffic signals. They will normally be provided where a significant number of pedestrians or pedal cyclists experience difficulty and/or delay in crossing a road at certain times during the day. Situations in which pedestrian or pedal cyclist signals may be used are:

(a) at signalised road junctions; and

(b) at signalised mid-block pedestrian and pedal cyclist crossings.

3 Warrants for the provision of signals at pedestrian and pedal cyclist mid-block crossings are given in Chapter 2 of this manual (Volume 3).

4 **The general provisions for vehicular traffic signals given in Chapter 3 of this manual (Volume 3) shall also apply to pedestrian and pedal cyclist signals and to vehicular traffic signals used in conjunction with such signals, except where otherwise noted in this chapter.**

5 Where pedestrian signals are not provided at a junction, vehicular traffic shall yield right of way to pedestrians lawfully in the junction. Pedal cyclists, however, do not have the same right of way and are treated similar to vehicular traffic when pedal cyclist signals are not provided.

4.2 PEDESTRIAN AND PEDAL CYCLIST SIGNALS

1 Pedestrian light signals shall comprise:

(a) a STEADY GREEN MAN LIGHT SIGNAL, followed by:

(b) a FLASHING RED MAN LIGHT SIGNAL, followed by:

(c) a STEADY RED MAN LIGHT SIGNAL.

2 Pedal cyclist signal installations shall comprise:

(a) a STEADY GREEN PEDAL CYCLIST LIGHT SIGNAL, followed by:

(b) a FLASHING RED PEDAL CYCLIST LIGHT SIGNAL, followed by:

(c) a STEADY RED PEDAL CYCLIST LIGHT SIGNAL.

3 Pedestrian and pedal cyclist light signals shall have the significance assigned to them in the National Road Traffic Regulations. The meanings assigned to the different light signals below are quoted directly from the regulations.

4 A STEADY GREEN MAN LIGHT SIGNAL indicates ***"to a pedestrian that he or she may cross the roadway within the pedestrian crossing markings RTM3 or RTM4 as appropriate, and that the driver of a vehicle shall yield right of way to a pedestrian crossing such roadway"***.

5 A STEADY GREEN PEDAL CYCLIST LIGHT SIGNAL indicates ***"to a pedal cyclist that he or she may cross the roadway within the pedal cyclist crossing, and that the driver of a vehicle shall yield right of way to a pedal cyclist crossing such roadway"***.

6 A FLASHING RED MAN LIGHT SIGNAL indicates ***"to a pedestrian (a) who has not yet commenced crossing the roadway that he or she shall not cross the roadway until the steady green man light signal is displayed, or (b) who is within a pedestrian crossing that the steady red man light signal will follow shortly"***.

7 A FLASHING RED PEDAL CYCLIST LIGHT SIGNAL indicates ***"to a pedal cyclist (a) who has not yet commenced crossing the roadway that he or she shall not cross the roadway until the steady green pedal cyclist light signal is displayed, or (b) who is within a crossing that the steady red pedal cyclist light signal will follow shortly"***.

8 A STEADY RED MAN LIGHT SIGNAL indicates ***"to a pedestrian that he or she shall not cross the roadway until the steady green man light signal is displayed"***.

9 A STEADY RED PEDAL CYCLIST LIGHT SIGNAL indicates ***"to a pedal cyclist that he or she shall not cross the roadway until the steady green pedal cyclist light signal is displayed"***.

10 A GREEN MAN or PEDAL CYCLIST LIGHT SIGNAL shall not be displayed at the same time as a FLASHING or STEADY RED MAN or PEDAL CYCLIST LIGHT SIGNAL on the same crossing.

11 A pedestrian signal face shall comprise two light signals, one depicting a red standing man and the other depicting a green walking man. The standard signal face Type S11P shall be used. The red man shall be located in line directly above the green man signal aspect.

12 A pedal cyclist signal shall comprise two light signals, displaying a green and red bicycle symbol respectively when illuminated. The standard pedal cyclist signal face Type S11C shall be used. The red pedal cyclist shall be located directly in line above the green pedal cyclist aspect.

4.3 OPERATION OF PEDESTRIAN AND PEDAL CYCLIST SIGNALS

1 The function of the steady GREEN MAN and GREEN PEDAL CYCLIST LIGHT SIGNAL is to provide a limited initial "step off" or "launching" interval for pedestrians and pedal cyclists. It SHALL always be followed immediately by a FLASHING RED MAN or PEDAL CYCLIST LIGHT SIGNAL.

2 The STEADY GREEN MAN or PEDAL CYCLIST LIGHT SIGNAL shall be displayed for an interval appropriate for the particular traffic conditions and shall be not less than a minimum of 4 seconds. A longer interval of 5 to 7 seconds, however, is more desirable. Longer intervals may be required when pedestrian volumes are high, but volumes requiring an interval longer than 7 seconds do not occur often. Where vehicular capacity is important, the green interval should not be made longer than necessary. However, where capacity is not important, the maximum possible pedestrian green may be given.

3 Sufficient time must be provided after the green man or pedal cyclist light signal for a pedestrian to walk or pedal cyclist to push his or her bicycle across the roadway to the other side of the road, or up to the median island where such median is provided. Where the median is set back from the pedestrian crossing, sufficient time must be provided to allow crossing of the junction in one stage.

4 A design walking speed of 1,2 m/s should be used for calculating the pedestrian or pedal cyclist ***clearance time*** under normal operating conditions. A slower speed of 1,0 m/s may be used for elderly or infirm pedestrians. The pedestrian or pedal cyclist must be able to clear the roadway by the time the parallel ***vehicular intergreen*** ends (end of the ***all-red*** interval).

5 The FLASHING MAN or PEDAL CYCLIST LIGHT SIGNAL should not be displayed for a period longer than the duration of the pedestrian or pedal cyclist ***clearance time.*** The flashing signal can, however, be displayed for a shorter period if a STEADY RED MAN or PEDAL CYCLIST LIGHT SIGNAL is displayed for the remainder of the clearance time. The flashing signal should not be displayed for a period shorter than the ***minimum*** of the following two values:

(a) 75% of the clearance time; or

(b) the clearance time less the parallel vehicular intergreen period.

6 At road junctions, the pedestrian or pedal cyclist phase may run concurrently with a parallel vehicular phase. **The vehicle phase, however, SHALL not include any exclusive turning phase in conflict with the pedestrian or pedal cyclist green phase.**

7 The green man (and pedal cyclist) signal normally starts at the same time as the vehicular green. The vehicular green light signal, however, may be delayed to allow pedestrians to enter the roadway ahead of vehicles. Care should be taken in using delays longer than 3 seconds as such delays can lead to undesirable behaviour. Such behaviour may include illegal turning manoeuvres by drivers and pedestrians (or pedal cyclists) utilising the delay to cross the junction in the wrong direction.

8 At a ***mid-block pedestrian or pedal cyclist crossing***, other than where a "Pelican" phase has been provided, a vehicular red light signal SHALL be displayed for at least the full duration of the green and flashing red man or pedal cyclist intervals. It may also be necessary to introduce an "all-red" interval.

9 At a mid-block pedestrian or pedal cyclist crossing, a "Pelican" phase may be provided to indicate to drivers of vehicles that pedestrians may be clearing the road and have right of way. During the "Pelican" phase, vehicular FLASHING RED DISC LIGHT SIGNALS are displayed at the same time as the FLASHING RED MAN or PEDAL CYCLIST LIGHT SIGNAL. **Pedestrians may not enter the crossing on the flashing red man, and the duration of this interval should therefore NOT exceed the time required by pedestrians to clear the crossing.**

10 Pedestrian phases should generally be demand dependent (using push buttons), even when used at fixed time signals. This is because the vehicular green interval is often made longer to meet pedestrian requirements. When no demand is registered for a signal phase, a shorter vehicular green phase can be provided which could reduce overall vehicular delay.

11 When vehicular signals are in flashing mode, pedestrian and pedal cyclist signals must be switched off, giving no pedestrian or pedal cyclist indications (except when the signal is operating in pelican mode).

4.4 PROVISION OF PEDESTRIAN SIGNALS AT JUNCTIONS

1 Pedestrian signals at junctions have the advantage that safety is improved by restricting the pedestrian movement to a shorter period of time during a signal cycle. It also has the advantage that the capacity of the left-turn vehicular movement is increased.

2 Pedestrian signals can be considered when exclusive vehicular left- or right-turn phases are provided that conflict with pedestrian movements (alternatively, PEDESTRIAN PROHIBITED SIGNS R218 may be posted). However, pedestrians do not have right of way when no pedestrian signals are provided and flashing green signals are displayed.

3 Pedestrian signals may also be provided on one-way roads where vehicular signals are provided only in the one direction and no signals are available in the other direction.

4 Pedestrian signals should be considered when large numbers of pedestrians cross the road and pedestrians can impede turning traffic. A capacity analysis can be undertaken to establish whether pedestrian signals would improve the traffic flow.

5 Pedestrian signals may be considered on an approach when the pedestrian volume crossing the particular approach multiplied by the volume of conflicting turning traffic exceeds 10 000 in any one hour, or 5 000 for each of any four hours of a day.

6 Pedestrian movements across slipways at junctions may be signalised where warranted by pedestrian queues or delays, or when pedestrians require additional protection due to special conditions such as high vehicle speeds, poor sight distance and pedestrian disabilities.

7 The non-observance of traffic signals by pedestrians may create capacity problems for turning movements at junctions. This problem can be reduced by providing protected turning phases for vehicles, during which a RED MAN LIGHT SIGNAL is displayed. A pedestrian green signal can be displayed during the main signal phase.

4.5 PEDESTRIAN SCRAMBLE PHASE

1 The pedestrian scramble phase is also known as an exclusive or serial pedestrian phase. Such a phase allows only pedestrians to walk across the junction while all vehicles receive RED LIGHT SIGNALS and are not allowed to enter the junction from any approach. Provision can also be made for the ***diagonal*** crossing of the junction by pedestrians.

2 The main advantage of the scramble phase is that it can eliminate pedestrian-vehicle conflict, thus improving the level of safety. This, however, will only be achieved if full pedestrian compliance of the light signals can be obtained. In practice, pedestrians may utilise the scramble phase as well as the vehicular phases to cross the junction.

3 The capacity of turning movements at junctions can be improved by the provision of scramble phases (but only when pedestrians do not violate the light signals). The capacity of straight-through movements, however, is significantly reduced by scramble phases.

4 Scramble phases can be effectively utilised in pedestrian precincts where vehicular capacity is of less importance. Such phases can create an environment in which priority is given to pedestrians and vehicular traffic flow is of less concern.

4.6 LAYOUT OF PEDESTRIAN AND PEDAL CYCLIST SIGNALS

1 A pedestrian signal face Type S11P or a pedal cyclist signal face Type S11C is provided for each direction of movement at a junction or mid-block crossing (both sides of the roadway).

2 The signal faces may be mounted on the same posts as vehicular signal faces, either parallel or perpendicular to the vehicular faces as shown in Figure 4.1. The following criteria should be used in selecting posts for the mounting of pedestrian signal faces:

(a) The signals should be in line with the pedestrian crossing, at a position where pedestrians can readily see the signals.

(b) The signals should not be located at a position where vehicles stopping at, or slightly beyond, the stop line may obstruct the visibility of the signals. Attention must particularly be given to the possible obstruction of the signal face by buses and heavy vehicles.

(c) The signal posts should not impede the flow of pedestrian traffic.

(d) The number of signal posts should be restricted to avoid clutter on the sidewalk and to reduce installation and maintenance costs.

3 Where no vehicular light signals are provided, consideration can be given to providing a second pedestrian or pedal cyclist signal face as a backup should one of the signals fail.

4 At signalised mid-block pedestrian or pedal cyclist crossings, type S1 traffic signal faces shall be used to control vehicular traffic. There shall be at least two S1 traffic signal faces for each approach on the far side of the stop line, as shown in Figure 4.2. A supplementary S1 signal face is also recommended on the near side of the crossing, not further than 3 m from the prolongation of the stop line.

5 The S1 signal faces on the far side SHALL be not less than 3 m apart and not more than 20 m apart. Additional overhead mounted S1 signal faces SHALL be provided if the faces are more than 20 m apart (preferably more than 16 m apart). On a divided carriageway road with a median of adequate width, the right-hand S1 signal face SHALL be located on the median island.

6 The left-hand S1 signal faces should not be located more than 2 m laterally from the edge of the roadway.

7 On very wide roads, the time required by pedestrians to clear a crossing may be excessive. Consideration can then be given to the possibility of providing a staggered pedestrian crossing as shown in Figures 4.3 and 4.4. Such crossings can be crossed during two signal cycles, which reduces the clearance time that must be provided during one signal cycle.

8 Pedestrian crossing lines or blocks may not be less than 2,4 m wide, but a width of 3,0 m is preferred. Where large volumes of pedestrians are present, the width can be increased (but not more than a recommended maximum of 5 m). The minimum distance between the pedestrian crossing lines or blocks and the stop line (RTM1) is 1 m at junctions and 3 m at mid-block crossings.

4.7 MOUNTING OF PEDESTRIAN AND PEDAL CYCLIST SIGNALS

1 Pedestrian and pedal cyclist signal mounting details are shown in Figure 4.6. The signals should preferably be post-mounted. The signals should have a minimum clearance above the sidewalk of not less than 2,1 m. The signal face should be not more than 3,0 m above the level of a point on the road surface nearest to the post, measured to the centre of the lowest (green) light signal.

2 **Where the pedestrian or pedal cyclist signal face is mounted adjacent to a vehicular signal face, the red man or pedal cyclist signal aspect SHALL not be mounted higher than the level of the lowest vehicular green signal aspect.** The pedestrian or pedal cyclist signal faces should not be located in a line vertically with any vehicular signal aspect facing the same direction and should be offset to the left or right of such signal aspect.

3 The pedestrian or pedal cyclist push button should be mounted approximately 1,1 m above the sidewalk surface. A pedestrian or pedal cyclist sign should preferably be placed immediately above or below the push button. Preferred locations and directions of push buttons are shown by the hand symbols in Figures 4.1 to 4.4.

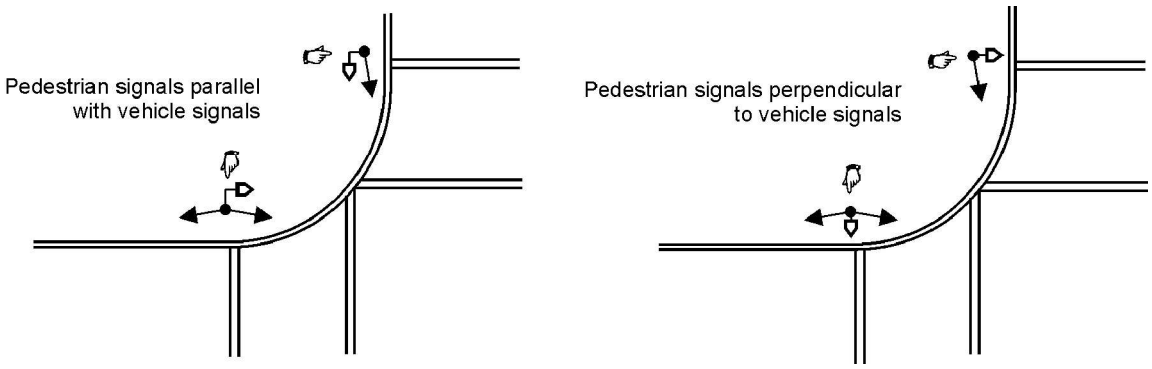

Figure 4.1: Alternative positions for pedestrian and pedal cyclist signals at signalised junctions

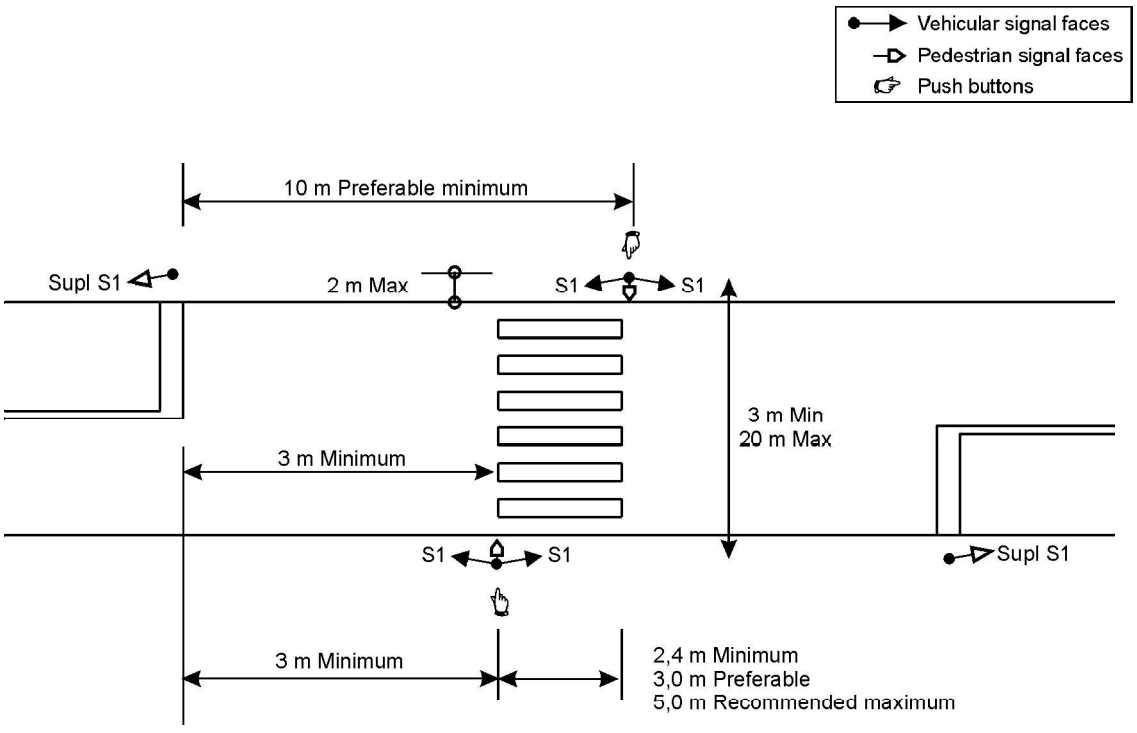

Figure 4.2: Pedestrian (and pedal cyclist) signal faces at a mid-block crossing

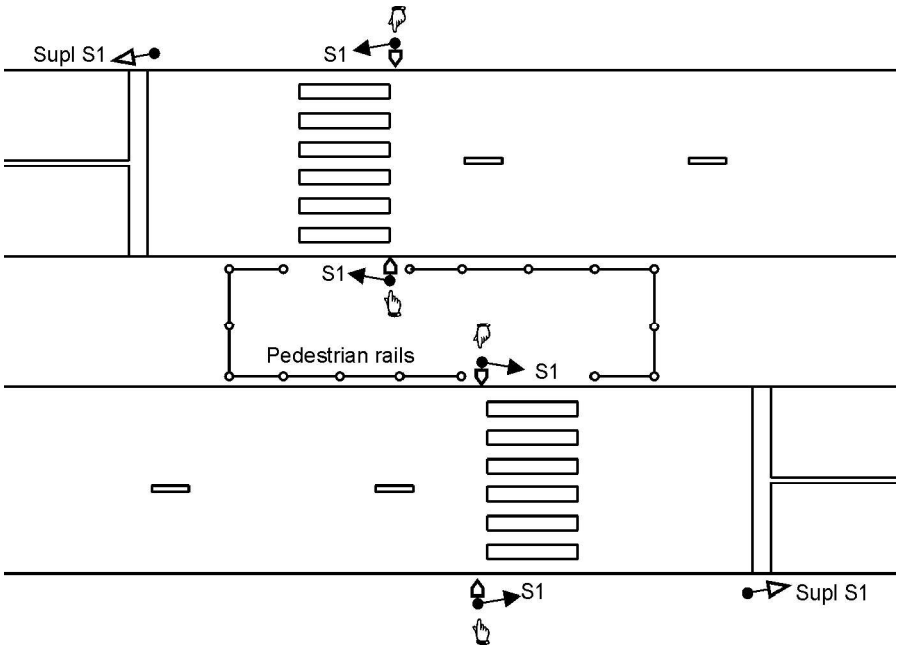

Figure 4.3: Staggered mid-block pedestrian crossing

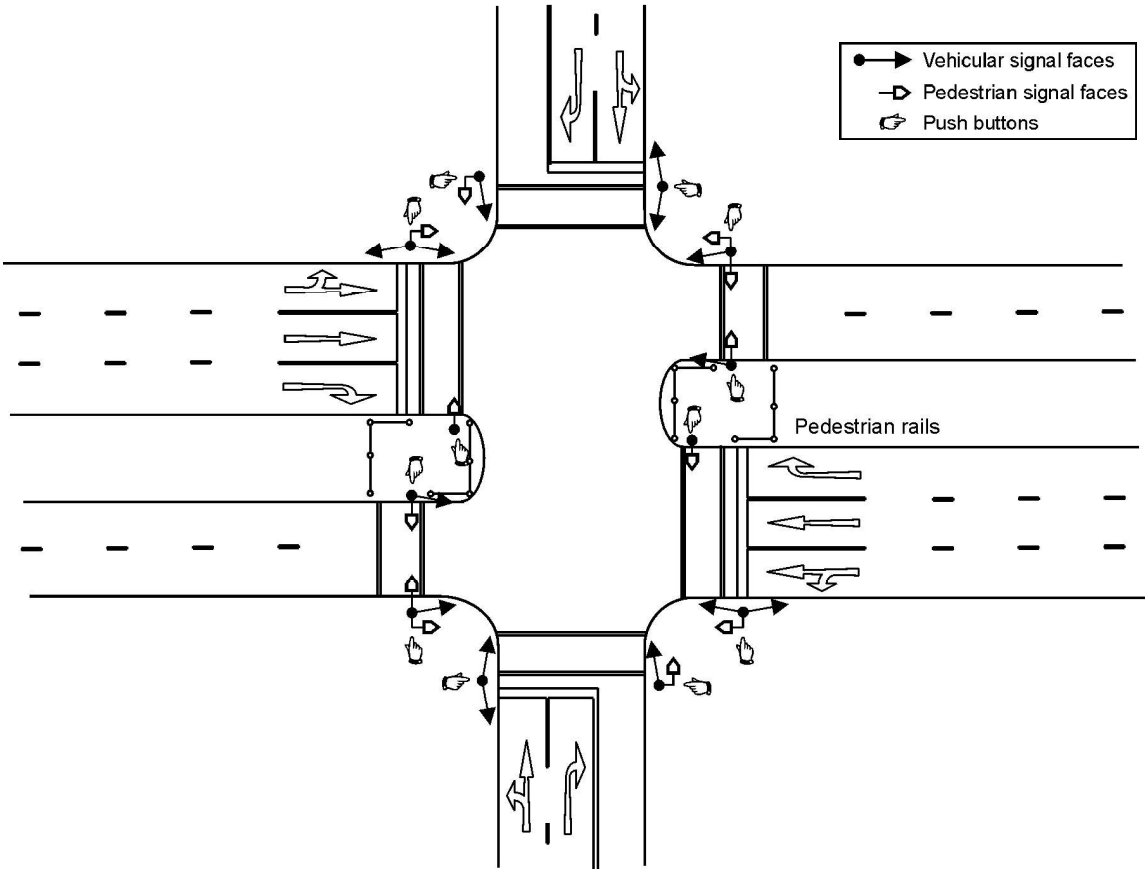

Figure 4.4: Staggered pedestrian crossing on a wide junction

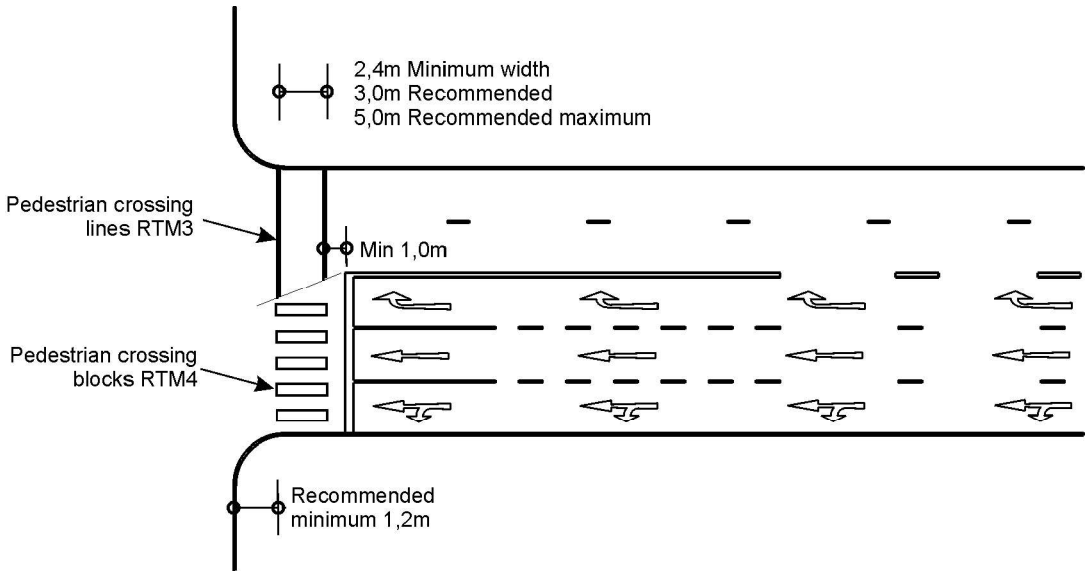

Figure 4.5: Pedestrian crossing road markings at a junction

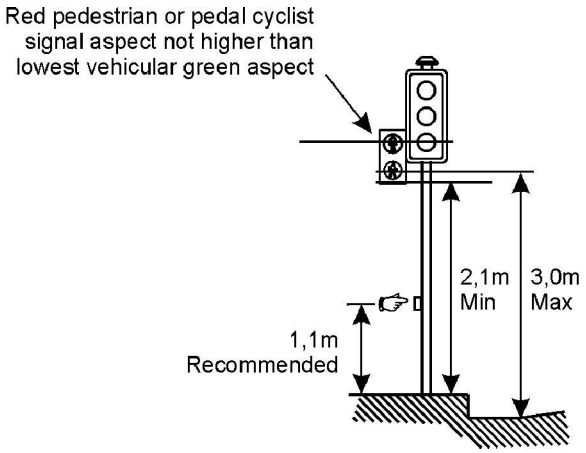

Figure 4.6: Mounting pedestrian and pedal cyclist signals