CHAPTER 17: FACILITIES FOR DISABLED USERS

17.1 INTRODUCTION

1 Facilities can be provided at signalised junctions and pedestrian crossings for pedestrians with physical disabilities (no such facilities are required by disabled drivers). The following groups of disabled persons can be accommodated at signals:

(a) those confined to wheelchairs; and

(b) those with visual impairments.

2 With regard to persons confined to wheel-chairs, it is particularly important that recessed ramps should be provided in the corner kerb, and that push buttons can be reached (a mounting height of 1,1 m would be acceptable). It may also be necessary to provide a longer flashing red man clearance interval.

3 The remainder of the chapter will be devoted to the needs of pedestrians with visual impairments.

17.2 THE PROBLEMS OF PEDESTRIANS WITH VISUAL IMPAIRMENTS

1 Pedestrians with visual impairments are confronted by a host of problems when attempting to cross a street at a signalised junction or pedestrian mid-block crossing. These can be summarised as:

(a) Knowing when to begin crossing.

(b) Crossing in the correct direction.

(c) Using push buttons.

2 In the absence of audible signals, visually impaired pedestrians rely on hearing the surge of traffic at signalised junctions moving in a parallel direction as a marker for the start of crossing. A problem with a scramble or exclusive pedestrian signal phase is that a surge does not occur and, short of being told by a bystander, the visually impaired pedestrian would find it difficult to know when to begin crossing.

3 Parallel traffic provides an acoustic guideline to help pedestrians with visual impairments to cross the street without veering to one side or the other. Intermittent traffic does not offer the required guidance. Such pedestrians may also find it difficult to cross the road if the crosswalk is far removed from the parallel traffic flow.

4 The geometry of the junction can also be a source of confusion to pedestrians with visual impairments. Have they successfully crossed the street or have they merely found the median island? It may also be difficult to differentiate between medians and islands provided at slipways.

5 Push buttons present two problems, namely locating the push button and then establishing the direction of movement to which it applies. Visually impaired pedestrians memorise the position of push buttons and the direction to which they apply as they learn a particular route. Push buttons should therefore be located as consistently as possible relative to the position of the crosswalk. Preferred locations for push buttons are shown in Chapter 4 of this manual (Volume 3).

17.3 FACILITIES TO ASSIST VISUALLY IMPAIRED PEDESTRIANS

17.3.1 General

1 The provision of facilities for pedestrians with visual impairments is not a simple matter, and no satisfactory solution has as yet been developed. The following are a number of facilities that have been provided and tested:

(a) Audible signals.

(b) Vibrotactile signals.

2 In addition to the above facilities, a number of special devices have been developed that require highly sophisticated equipment and technology to communicate with or identify visually impaired pedestrians. Many of these are still in an experimental phase and are not available in commercial systems. These systems are not discussed in this manual.

17.3.2 Audible signals

1 Audible signals may be used to indicate to visually impaired pedestrians that the green man light signal is provided (no such signal is required for the flashing red man clearance interval). The signal is sounded for a short duration at the start of the green man light signal.

2 Although audible signals may, at first glance, appear to be the best available solution, they are not always as useful as they could be. There are a number of problems. The first of these is the problem of noise pollution. For the visually impaired pedestrian, there is also the problem of identifying which crosswalk has the walk signal.

3 The problem of noise pollution can to some extend be addressed by carefully adjusting the volume of the audible signal. Provision can also be made for automatically adjusting the volume of the signal in response to ambient sound levels.

4 The problem of identifying which crosswalk has the walk signal can be addressed by using different tones or signals. Standardised tones may be adopted at different junctions and crossings in an area to indicate crosswalk directions. Verbal messages may also be given indicating the name of the street that can be crossed.

5 Where pedestrians experience problems in locating push buttons, audible locator signals may be considered to assist pedestrians in finding the push buttons. A special tone is required to allow the pedestrian to locate the push button. These signals, however, make the problem of noise pollution even worse since they have to be in continuous operation.

17.3.3 Vibrotactile signals

1 Vibrotactile devices communicate information to pedestrians through a vibrating surface by touch. These devices address the problem of noise pollution associated with audible signals, but only if they are designed in such a way that the vibrations are not audible.

2 Vibrotactile signals can be provided in the form of a vibrator attached to a signal post. The vibrator should be continuously vibrating to indicate to the pedestrian that it is in operation and not out of order. Two levels of vibration are used, one to indicate that the green pedestrian signal is being displayed, and the second to indicate the red or flashing red light signal.

3 The frequency and amplitude of vibration would have to be carefully selected to ensure that the pedestrian can differentiate between the two signals. It is also important that the pedestrian does not confuse the vibration with an electrical shock.

4 The vibrators should be installed on the same posts as the normal pedestrian push buttons. The position of the post can be used to indicate the direction to which the vibrotactile signal applies. Where this is not adequate, a raised arrow may be mounted on the vibrator indicating the direction of the signal.