17 LIGHTING THE PEDESTRIAN NETWORK

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17.1 Introduction

Lighting has several purposes for pedestrians [10, 46, 139]. It:

- illuminates potential hazards so pedestrians can avoid them
- enables pedestrians to read signs and orient themselves
- affects feelings of personal security and comfort
- enables drivers to see pedestrians and thereby improves their safety
- can enhance the walking environment
- makes the pedestrian network continuously available, not just during daylight hours
- can encourage pedestrians to use some routes rather than others.

Street lighting is not always adequate for pedestrians on footpaths within road reserves [166] – walking conditions can change and the initial scheme may have been inadequate.

17.2 The need for lighting

Pedestrian lighting should be specifically assessed and additional lighting provided where [10, 46, 139]:

- there is potential for conflicts with motorised vehicles, such as at road crossings
- there may not be enough natural light, such as in areas enclosed by high buildings
- there are large numbers of vision impaired people, who are less able to adapt to differing levels of ambient light
- pedestrians are likely to congregate at night, such as at bus stops, car parks and leisure activity locations
- levels change, such as at steps, ramps, overbridges and underpasses/subways
- specific hazards may be difficult to identify in low light, including temporary works
- a cluster of pedestrian crashes occur during hours of darkness
- there is not enough natural surveillance (see section 4.4).

Visits to sites during the hours of darkness are important as they can establish the pedestrian environment, such as vehicle speeds, pedestrian levels, lighting from other sources (such as shops), and vegetation that may cast shadows.

17.3 Lighting scheme design

Generally, the overall lighting level and the absence of glare are important for pedestrians [10]. This means [10, 46, 68, 139]:

- most lamps should be shielded to ensure light is mainly directed downwards, to both improve energy efficiency and minimise light pollution. The exception to this is in pedestrian precincts where there is no conflict of glare to motorised traffic and light can be emitted horizontally
- there should be an element of 'redundancy', so that if one lamp fails, another will continue to provide at least some light in the affected area
- where footpaths are within road reserves, placing lights along both sides of the road is better for pedestrians than putting them within the roadway median.

Photo 17.1 – Low mounted lighting in wall by ramp, Queenstown (Photo: Tim Hughes)

'AS/NZS 1158.3.1: 1999 [68]' is the standard for lighting; it applies to pedestrian-only areas and those with a mix of pedestrians, vehicles and cyclists. The standard also covers the lighting required at pedestrian islands and traffic-calming measures. A specialist road lighting engineer should be consulted owing to lighting source complexity and interrelationships [146].

Generally, along the road corridor, if lighting is provided at the level needed for motorised traffic to move safely, then in most circumstances this should be sufficient to light the adjoining footpaths. However, as roads become less busy, the potential for pedestrian movements and vehicle conflict declines and the requirement for continuous, equal lighting is reduced [139]. In these areas, spot or 'highlight' lighting may be appropriate.

Some rural residents may not want any lighting at all to preserve the environment. Their wishes must be balanced with those of passing pedestrians and visitors, especially at important pedestrian flow areas such as transport stops, key intersections and leisure activity locations [139].

17.4 Locating lighting

Lamp post location is determined by the illumination level provided, so spacings are calculated case by case [68]. Even then, it is not possible to achieve an exact spacing every time because of intersections, driveways, trees and other utilities. It may be possible to locate lamps on existing power poles, as long as the spacing is adequate.

Lights mounted on tall columns in high-use pedestrian areas reduce the intimacy of a public place. Lights mounted close to the ground may encourage vandalism or introduce glare within the normal pedestrian field of vision. Nevertheless, ground-level lighting can be useful in less heavily used pedestrian areas.

Lamp posts create an obstruction for pedestrians and cyclists, so should be sited with care.

Photo 17.2 – Medium height lighting column, Christchurch

17.5 Lighting hue

Studies have shown that pedestrians in intensively used areas prefer lighting to mimic daylight [46, 139]. Unless required for a particular reason, avoid using low-pressure sodium lights, as the yellow light they produce has a high level of colour distortion [46, 139].

17.6 Maintenance

Pedestrian lighting should be fully integrated within road controlling authority (RCA) road lighting maintenance processes and asset management systems.

17.7 Lighting at new developments

Lighting requirements of all new and improved developments should be assessed as a matter of course. The developer is responsible for demonstrating that pedestrian lighting has been assessed and all relevant standards met.

17.8 Lighting at pedestrian crossing points

Pedestrian crossing points need more intense lighting than footpaths to ensure they are conspicuous to pedestrians and that approaching drivers can see pedestrians clearly [10, 146]. The lighting standard 'AS/NZS 1158.3.1: 1999 [68]' particularly considers:

- steps and stairways, ramps and footbridges
- underpasses including associated ramps and steps
- pedestrian islands.

For other pedestrian crossing points, RCAs should place floodlights on the approach side(s) to better illuminate pedestrians using the crossing [82]. This should be done by:

- identifying the pedestrian crossing points that are used at night
- identifying the risks to pedestrians at each location
- identifying the current lighting levels at each location
- ranking locations by these three criteria and improving the sites with the greatest need.

Lighting in underpasses requires specific attention owing to pedestrians' personal safety concerns [10, 146]. Lighting on the approaches and within the underpass should appear bright while avoiding glare and shadows. This can be done by carefully selecting surface textures and colours [146].

When the ratio of underpass length to height exceeds 10:1, lighting should operate continuously [139, 146]. Otherwise, lights next to the entrance and exit should provide enough illumination [139].

During the day, underpass lighting should be bright enough to allow pedestrians to see into the underpass [10, 139, 146]. At night, it should be less bright so that pedestrians in the underpass can see the areas surrounding the exit. This can be done by reducing the lighting intensity at the underpass entrance and exit [146].

Avoid using recessed lamps that create pools of light [146]. As underpass lamps will be at a relatively low level, they should be made of polycarbonate or be otherwise resistant to vandalism [139, 146]. Consider installing an emergency lighting system to ensure illumination if the main power supply fails.

Photo 17.3 – Crossing point lit from beacon pole, Hamilton (Photo: Shaun Peterson)

Photo 17.4 – Pedestrian crossing floodlit from lantern on black and white pole, in advance of crossing, Christchurch (Photo: Tim Hughes)