



Figure 4-50: Path lighting is particularly important where ambient light levels change dramatically, as in an underpass.

Figure 4-51: Path users need to see small obstacles and changes in surface to feel safe at night.



4.13 Lighting

Fixed-source lighting improves visibility along paths and at intersections. In addition, lighting allows the bicyclist to see the path direction, surface conditions and obstacles. Lighting for shared use paths is important and should be particularly considered where night usage is expected, such as on urban and suburban paths serving college students or commuters, especially those consistently serving both pedestrians and bicyclists. Even where lighting is not used for the path itself, lighting of intersections at trails and roadways should be strongly considered. Lighting should also be considered through underpasses or tunnels (fig. 4-50), and where nighttime security could be an issue.

Shared-use path designers should take into consideration a number of lighting-related factors:

- **Night vision:** Both bicyclists and pedestrians have specific requirements for nighttime seeing. Both need to see small obstacles and changes in pavement surfaces to feel safe using paths at night. Uniform illumination should be provided that avoids “hot spots” and deep shadows, and care must be taken to avoid glare, which can compromise night vision.

- **Illumination levels:** Recommended light levels for shared-use paths are considerably lower than those for roadways and other outdoor lighting applications (see Table 4-9).

Table 4-9 Recommended Illumination for Shared-use Paths

Lux/Foot Candles
(from IESNA DG-5-1994, Table 2)

	Avg. Horizontal Illuminance Levels	Horizontal Avg:Min	Average Vertical Illuminance Levels	Vertical Avg:Min
Paths along streets:				
Commercial	10/1	4:1	20/2	5:1
Intermediate	5/0.5	4:1	10/1	5:1
Residential	2/0.2	10:1	5/0.5	5:1
Paths away from streets:	5/0.5	10:1	5/0.5	5:1

- **Luminaire Design:** Typical pole mounted roadway lights are a poor choice for illuminating narrow paths. Standard Type II horizontal lamps create spill light off the path, and require excess wattage and/or more frequent placement to maintain uniformity. If pole mounted lights are specified, Type I horizontal lamps should be used.



Figure 4-52: Type II horizontal lamps provide more light than is necessary.

- **Luminaire placement:** Uniformity of illumination is particularly important for shared-use paths. Bicyclists moving between “hot spots” from poorly placed luminaires may be unable to see in the interspersed shadows. Providing some overlap allows for a more constant visual environment, and can help prevent crashes.

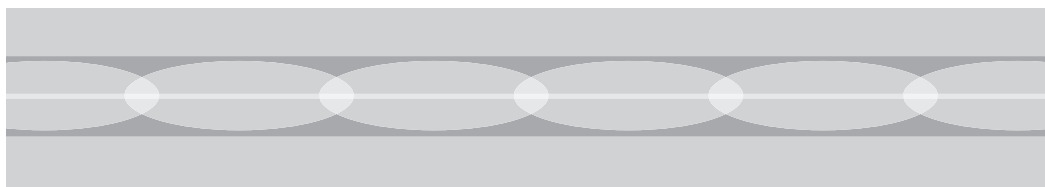
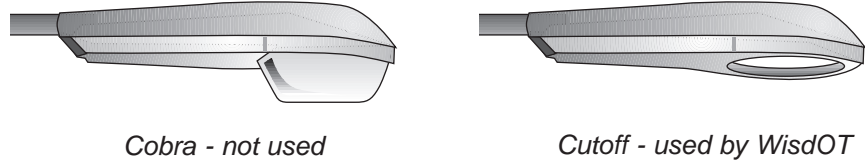


Figure 4-53: Properly spaced luminaires overlap to provide a more constant visual environment.

- **Full cutoff:** Glare from cobra-style luminaires should be avoided in all cases. Particular attention should be given to pathways adjacent to residences, waterways, or natural areas

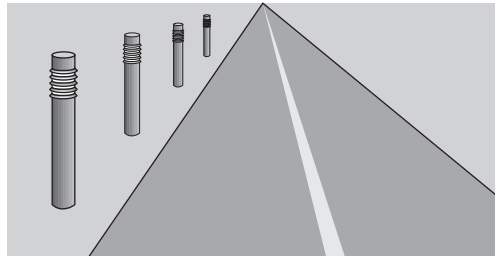
where spill light and glare are unacceptable (fig. 4-54). Full cutoff luminaires are a minimum requirement for all path illumination, while special shielding may be required for more sensitive areas.

Figure 4-54: Cobra-style luminaires create spill light and glare and should not be used.



- **Bollards:** Lights mounted below eye level can also be used for illuminating shared-use paths (fig. 4-55). More frequent spacing, combined with lower wattage bulbs, can meet recommended levels of illuminance and uniformity while reducing operating costs.

Figure 4-55: Lights mounted in bollards can provide adequate illumination while reducing operating costs.



When choosing these fixtures, select a type that eliminates glare, since bicyclists' eye level will be just above these lights. These fixtures should be placed at least 2 ft (0.6 m) from the path edge.

- **Security:** The ability to recognize individuals and threats to security must also be considered when designing path lighting. Good security begins with recommended levels of illumination and uniformity, but also requires consideration of bulb type and light color. For example, low-pressure sodium bulbs, while energy efficient, provide poor color rendition and compromise the viewer's ability to recognize faces. Paths through high-risk areas may require additional area lighting to provide the user with a wider view for threat detection.

Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances identified in Figure 4-76. Luminaires and standards should be at a scale appropriate for a pedestrian (i.e., no taller than 15 ft (4.5 m)).



Figure 4-56: Signing and marking paths are important elements of the overall design.

4.14 Signing and marking

Adequate signing and marking are essential on shared-use paths. And these elements fall into the same three main categories found in roadway signing and marking: regulatory, warning, and informational devices. Each category is associated with certain colors. Regulatory controls are associated with red, black, and white*; warning devices with yellow and fluorescent yellow-green; informational devices are associated with blue, green and brown. *In striping, however, yellow is also a regulatory color.

4.14.1 Regulatory controls

Regulatory controls alert users to a legal condition that otherwise might not be obvious. Basically, they tell people what to do.

Dividing users: A 4-in (100 mm) yellow center line stripe (fig. 4-57) may be used to separate opposite directions of travel. Where passing is not permitted, a solid line may be used to separate the two directions of travel. This may be particularly useful for:

- heavy volumes of bicyclists and/or other users;
- curves with restricted sight distance; and
- unlighted paths where nighttime riding is expected.

Where passing is permitted, a broken yellow line should be used. Broken lines should have a 1-to-3 segment-to-gap ratio. A nominal 3 ft (0.9 m) segment with a 9 ft (2.7 m) gap is recommended.

Figure 4-57: At left is a solid yellow centerline, used where passing would be inappropriate. At right is a broken yellow line, used where passing is permitted.

