

## 9.2 RAILINGS, BARRIERS AND FENCES

### 9.2.1 Railings

Railings are retention devices used along paths on steep embankments and on bridges or overpasses. They should be high and strong enough to hold back a pedestrian, cyclist or wheelchair user who has strayed from their path of travel.

#### Design

On roadway bridges, railing height is dictated by the Canadian Highway Bridge Design Code, which require that railings be 1.37m high to protect cyclists. Other design requirements depend on whether the railing is intended for pedestrians and cyclists only or whether it is also serving as a guardrail for vehicles.

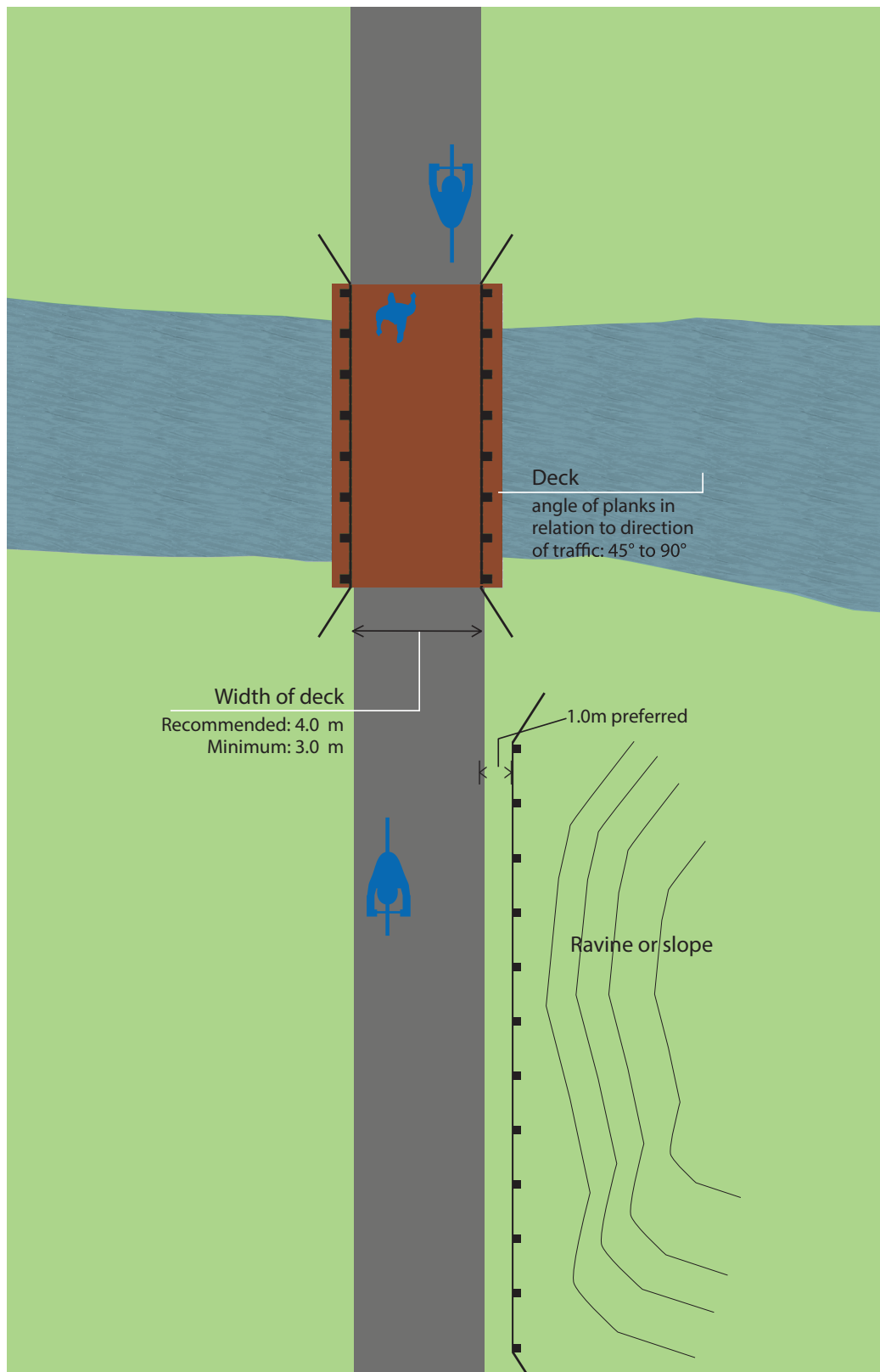
On stand-alone overpasses or along paths on steep embankments,<sup>1</sup> a height of 1.1 m is usually sufficient to hold back pedestrians or cyclists. Higher railings tend to obstruct users' views. A lateral clearance of 1.0 m from the edge of the path to the railing is preferred. If the recommended clearance cannot be achieved on the span of the bridge or overpass, the railings should taper outward at no more than a 30° angle to the path until they reach a clearance of 1 m (Exhibit 9-4). This funneling of the railings helps cyclists in particular avoid colliding with the ends of the railing.

A railing may consist of a wooden or metal fence, a concrete or brick wall, or a wall with a fence on top. The horizontal and vertical components of the railing should be close enough together to hold back a falling pedestrian or cyclist. Smooth horizontal components on the inside of the railing should act as a guardrail and prevent cyclists from catching if their knees, hips or handlebars if they come into contact with the railing. A round handrail with a 5 cm in diameter should be placed atop the railing, about 1.0 m high. This will help deflect a cyclist's handlebars or hips, which are usually situated between 90 cm and 110 cm above the ground.

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<sup>1</sup> Railings are necessary when the path sits atop an embankment sloped more than 30% with a vertical drop greater than 1.0 m.

Exhibit 9-4. Railing alignment along a multiuse path



Adapted from: Vélo Québec 2010

### 9.2.2 Guardrails and Safety Barriers

The purpose of guardrails and safety barriers along roads is to hold back vehicles that have strayed from their course. They are used primarily in rural settings along active transportation facilities next to roads with high traffic volumes and speeds. They are also used in cases where cyclists travel in the opposite direction to the vehicles in the adjacent lane. This is often the case when a multiuse path or bidirectional bicycle path is routed over a road bridge or underpass. Concrete barrier and highway guardrail design should consider provincial standards such as the Ontario Provincial Standards for Roads & Public Works.

### 9.2.3 Fences

Fences are used along active transportation facilities to protect the privacy of neighbouring properties and to discourage users from taking shortcuts through them. Similarly, they stop neighbouring property owners from encroaching on AT path right-of-way. In rural settings, they can also help to keep prohibited vehicles, all-terrain vehicles and farm vehicles, from accessing the path.

Clearances between cycling and pedestrian facilities and longitudinal objects such as fences are preferred to be 0.6 m – 1.0 m (refer to Section 4.5); however, this may be reduced to 0.25 – 0.50 m in constrained circumstances.





## Design

Fences can take many forms, including chain-link fences, plank fences, stone or brick walls, impassable ditches or hedges (Exhibit 9-5).

Fences should be installed only where they are essential. To prevent pedestrians and cyclists from taking shortcuts, a wet drainage ditch, thorny hedge or mesh fence 1.2 m high will suffice. However, to ensure the complete privacy of neighbouring properties, a wall, solid wooden fence or dense hedge at least 1.8 m tall may be required. If a fence is used, gates can be installed to provide access to trailside properties. When a ditch borders a path, bridges or culverts are required to link neighbouring properties to the path.

Exhibit 9-5. Multi-use path with a hedge (left) and chain-link fence (right)

