



Best practice bicycle safety – improvement fact sheet

# Driving conditions

## Overview

Poor driving and road surface conditions, e.g., uneven or slippery road surfaces can lead to cyclists losing control or skidding and falling which often results in injuries. Such driving and **surface condition hazards** can be **minimised** by several measures and solutions, e.g., **maintaining drainage openings in-level with the surrounding pavement**, installation of **drainage curb inlets**, improved **road maintenance** and implementation of **road lighting**.

## Types of problems that the solutions can solve

Driving condition hazards may be minimised by instituting **good design and maintenance practices**. In accordance with this, **drainage openings** should be maintained in-level with the **surrounding pavement**, which may require raising them after repaving. A bicycle-friendly design should be used so that bicycle tires will **not be trapped** by opening slots which are parallel to the roadway [1].

Particularly with new infrastructure or reconstruction, **drainage curb inlets** can be installed. Utility covers and other potential hazards should be removed from the predominant cycling infrastructure and should be **in-level with the surrounding pavement** and have **non-skid surfaces**. The pavement quality should be kept in a good condition, particularly near the edges where bicyclists tend to ride most often [1].

**Pavement seams** should be placed in a way that **minimises conflicts** with cyclists' right-of-way. Excessively wide gutters may unnecessarily reduce bicyclists' space. **Paving** over the gutter pan is a temporary solution, as the seams usually reappear in the pavement within five years. **Reflective raised pavement markers** also create hazards for bicyclists and should only be used with appropriate consideration of bicyclists, since they can deflect a bicycle wheel, causing the cyclist to lose control [1].

Driving in poor-lighting conditions can pose a hazard. A study by [2] conducted in the Netherlands found that the installation of road lighting reduced cycling injury and fatality risk, especially in rural areas. In addition to traffic safety, **adequate lighting** provides clear benefits in terms of personal security. Roadway lighting often serves the purpose of **safeguarding personal safety for pedestrians and bicyclists** as they move along/across roads. Darkness reduces **personal feeling of security**, and bicycling may therefore become uncomfortable and difficult, which reduces safety. Consequentially, ensuring that the lighting provides minimum acceptable

levels of illumination is of great importance to all users of a roadway environment [3].

Research conducted in [4] states that **prioritising walking and cycling areas in winter road maintenance** seems to be beneficial for both injury reductions and healthcare costs and sick leave due to injuries from slip accidents. Furthermore, research states that important **countermeasures for slippery surfaces, ice and snow** include improved **winter maintenance, removal of loose gravel** and **adjustment of curbs**, followed by **separated cycle tracks** and **removal of fixed objects** on and adjacent to the cycle tracks.

In the case of using shoulder rumble strips for vehicle users, a narrower design **placed close to the lane edge line** allows for more bicycle-friendly space. If textured elements are used, care should be taken that these do not compromise bicyclist safety or comfort [1].


Several issues which can impact driving condition should be looked at very closely, as described within [1]:

- » Initial **design** and **materials selection** can significantly help to prevent driving condition issues which arise due to poor drainage, slippery surfaces, gaps in pavement, and others. Once design standards are determined, inspectors and project contractors should ensure that standards are met.
- » Having a plan for regular sweeping and identifying risky elements as well as for making spot repairs is key to **keep cycling infrastructure in good condition**. It is important that bicyclist considerations are incorporated into **long-term maintenance and upgrades**.
- » Good design, hazard identification, and maintenance practices should be **institutionalised**. Identification of bicyclist priorities and a system for **regular inclusion** of best bicyclist facilities practices within a regular maintenance framework can help to improve conditions for bicyclists **without substantially increasing costs**.



### Characteristics

Measure	Costs	Treatment life	Effectiveness
Drainage	€€€	🕒🕒🕒	🚲🚲🚲
Road maintenance	€-€€	🕒🕒🕒	🚲🚲🚲
Lighting	€€€	🕒🕒🕒	🚲🚲🚲

### Implementation benefits

	Institutionalising good design, sweeping, and maintenance practices with respect to bicyclists can help to <b>reduce liability</b>
	Hazard identification programs can <b>facilitate identification and repair of potential surface hazards</b>

### Implementation issues

	<b>Lack of know-how</b> might be problematic for authorities when it comes to identifying priorities.
	<b>Lack of funding</b> might cause cycling related maintenance to be overlooked in favour of other transport modes.

### Examples

#### Winter maintenance, Denmark

In Denmark, roads and paths are divided into different winter classes. The categories are defined by the road or path's importance for traffic flows, and service objectives are prioritised accordingly. This optimises the use of resources and achieves a good mutual balance between traffic concerns, the environment, and funding [5].





## Energy-efficient LED lighting system, powered by solar energy, Belgium

From sunset to sunrise, the luminaires are dimmed by 80%. When a pedestrian or a cyclist is detected, the lighting goes back up to 100% for 100 metres and then lights up the users' path as they move along thanks to the detectors. After 11 p.m., only the luminaires at the start of the path are switched on at 20% of the light intensity to guide people in complete safety. The other luminaires are switched off and only come on when someone is detected. This lighting system guarantees the security of people using the path while protecting the flora and fauna along the section [6].



## Related fact sheets

### RISKS

- » Poor driving conditions

## References and links

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3. *FHWA (2009). Transportation Planning Handbook, Chapter 16: Bicycle and Pedestrian Facilities. In: <https://nacto.org/wp-content/uploads/2011/03/Transportation-Planning-Handbook-Bicycle-and-Pedestrian-Facilities.pdf>*
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5. *<https://cyclingsolutions.info/winter-maintenance-and-cleaning-of-roads-and-cycle-tracks/#prettyPhoto>*
6. *<https://www.schreder.com/en/projects/sustainable-self-supporting-lighting-mandel-bike-path>*

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**SABRINA: No fears about safety on two wheels.**

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