



Best practice bicycle safety – improvement fact sheet

# Overpasses and underpasses



## Overview

Where cycling routes intersect with roads that have high annual average daily traffic (AADT), crossings should be grade-separated to provide **maximum level of both safety and mobility**. Overpasses and underpasses can also be used to **cross other barriers** – railroads, rivers or canals, cliffs etc. This type of infrastructure provides **continuity of access** for bicyclists and **prevents significant detours**. Over- and underpasses encompass different types of structures, including bridges, and are usually very **expensive**, though some cost savings can be achieved depending on the materials used.

## Types of problems that the solutions can solve

Effectively planned and designed over- and underpasses can **support safe pedestrian and cyclist movements**, provide a **cost-effective crossing option** to meet identified desire lines, reduce delays to traffic, and **provide network connectivity** [1].

One research [3] stated that installation of grade separated intersections (bicycle bridges or tunnels) to cross distributor roads was found to be related to **strong reductions in the fatality crash rate**: A score that was developed to measure network level separation for Dutch




municipalities corresponded to a **24% decrease** in the likelihood of **fatal bicycle** crashes. The score combines the share of bicycle kilometres through traffic-calmed areas and the number of bicycle tunnels and bridges to cross distributor roads per bicycle kilometre.

However, it is important that over- and underpass are accessible for cyclists (e.g., no stairs), have a reduced slope and sufficiently comfortable dimensions with regard to the existing volume of cyclists [4].




## Characteristics

Measure	Costs	Treatment life	Effectiveness
Overpass [2]	€€€	⌚⌚⌚	🚲🚲🚲
Underpass [2]	€€€	⌚⌚⌚	🚲🚲🚲

## Implementation benefits

	<b>Separation from</b> motorised traffic significantly <b>increases safety</b>
	May offer some <b>shelter</b> from wind and rain
	Can be spectacular landmarks that help to create <b>awareness and promote the route</b>

Implementation issues

	<p>Possible <b>conflict points</b> at entrances and exits</p>
	<p><b>Costs</b> are relatively <b>high</b></p>
	<p>Extra <b>buffers</b> may be needed for „shy distance“ from railings or from traffic to protect bicyclists from sudden wind blasts or gusts.</p>

Examples:



*Eisenhower **tunnel** on the F325 cycle highway, the Netherlands. Straight approach, good visibility and smooth curves at the tunnel entrance, sunlight windows further in the picture [5]*



***Cycling bridge** in Slovakia [6]*

## Related fact sheets

### RISKS

- » Network issues
- » Narrow infrastructure
- » Speed differences in mixed spaces with pedestrians, E-Scooters etc.
- » Speed differences in mixed spaces with motorised traffic

## References and links

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In: <https://www.tmr.qld.gov.au/-/media/busind/techstdpubs/Cycling/Guideline-Bicycle-rider-and-pedestrian-underpasses.pdf?la=en>
2. *Bushell, M.A., Poole, B.W., Zegeer, C.V., Rodriguez, D.A. (2013). Costs for Pedestrian and Bicyclist Infrastructure Improvements.* In: [https://www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs\\_Report\\_Nov2013.pdf](https://www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf)
3. *Schepers, P., Twisk, D., Fishman, E., Fyhri, A., Jensen, A. (2017). The Dutch road to a high level of cycling safety. Safety science, 92, pp.264-273.*
4. *PRESTO – Promoting cycling for everyone as a daily transport mode (2015): Grade Separation. Implementation Fact Sheet.* [http://www.rupprecht-consult.eu/uploads/tx\\_rupprecht/11\\_PRESTO\\_Infrastructure\\_Fact\\_Sheet\\_on\\_Grade\\_Separation.pdf](http://www.rupprecht-consult.eu/uploads/tx_rupprecht/11_PRESTO_Infrastructure_Fact_Sheet_on_Grade_Separation.pdf)
5. <https://cyclehighways.eu/design-and-build/infrastructure/tunnels-and-bridges.html#gallery-466-1>
6. <http://www.interreg-danube.eu/approved-projects/danubeparksconnected/section/cycling-the-danube-in-slovakia>

**Publisher & Media Owner:** SABRINA Project Partners

**Contact:** Mrs. Olivera Rozi, Project Director, European Institute of Road Assessment – EuroRAP | [olivera.rozi@eurorap.org](mailto:olivera.rozi@eurorap.org) | [www.eira-si.eu](http://www.eira-si.eu)

**Graphic Design:** Identum Communications GmbH, Vienna | [www.identum.at](http://www.identum.at)

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The SABRINA Project has been co-funded by European Union Funds (ERDF, ENI).

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