

# iRAP Road Attribute Risk Factors

## Pedestrian Fencing



This factsheet describes the road attribute risk factors used in the iRAP methodology for Pedestrian Fencing. Pedestrian Fencing records if there is a fence present that is sufficient to restrict pedestrian crossing flow.

### About risk factors

Risk factors, sometimes called crash modification factors (CMF), are used in the iRAP Star Rating methodology to relate road attributes and crash rates. Risk factors (or CMF) are described by the Crash Modification Factor Clearing House as follows:

*A crash modification factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site.*

*For example, an intersection is experiencing 100 angle crashes and 500 rear-end crashes per year. If you apply a countermeasure that has a CMF of 0.80 for angle crashes, then you can expect to see 80 angle crashes per year following the implementation of the countermeasure ( $100 \times 0.80 = 80$ ). If the same countermeasure also has a CMF of 1.10 for rear-end crashes, then you would also expect to also see 550 rear-end crashes per year following the countermeasure ( $500 \times 1.10 = 550$ ).*

### Related documents

This factsheet should be read in conjunction with:

- *Star Rating Roads for Safety: The iRAP Methodology.*
- *Safer Roads Investment Plans: The iRAP Methodology.*
- *Star Rating and Investment Plan Coding Manual.*
- *Road Safety Toolkit (<http://toolkit.irap.org>).*

### Risk factors

Risk factors by road attribute category, road user type and crash type

Pedestrian fencing	Pedestrian crossing
Full length	0.00
At pedestrian crossing	1.00
None	1.25

### Selection of risk factors

There is limited research on assessing the likely benefit of “cattle fencing” on pedestrian route choice. The model assumes that no pedestrians cross the road where there is fencing and that is so strong or robust that it cannot be climbed. Turner et al. (2012) have reviewed the effect of fencing around crossings and demonstrated that a reduction

of 20% is plausible, higher if pedestrians are visible through the railings, hence the risk factor of 1.25. Turner et al (2012) say "Information sources used were Teale (1984) (14% reduction), Stewart (1988) (20% for low visible fencing), Campbell et al. (2004) (20%) and Elvik et al. (2009) (29%). Results from Retting et al. (2003) were excluded because they report results from Stewart (1998). The average CRF based on these figures was 21% (rounded to 20%) with a medium level of confidence."

## Background research and model development

This attribute was not included in earlier versions of the iRAP model.

## Primary references

The following publications are the primary references used in the selection of the iRAP road attribute risk factors. A complete list of citations is available in: iRAP Road Attribute Risk Factors: Full Reference List.

Elvik, R, Høy, A, Vaa, T, and Sørensen, M. (2009). The Handbook of Road Safety Measures, Second Edition (2009) Emerald Group Publishing Limited. ISBN 978-1-84855-250-0.

Lynam, D (2012). Development of Risk Models for the Road Assessment Programme. RAP504.12 and TRL Report CPR1293, Published by iRAP and TRL and available at: <http://www.trl.co.uk> and at <http://www.irap.org>.

Mak, K. and Sicking, D. (2003). Roadside Safety Analysis Program – Engineer's Manual. Transportation Research Board (TRB) National Cooperative Highway Research Program (NCHRP) Report 492. ISBN 0-309-06812-6.

Turner, B. Steinmetz, L., Lim, A. and Walsh, K. (2012). Effectiveness of Road Safety Engineering Treatments. AP-R422-12. Austroads Project No: ST1571.

Turner, B., Affum, J., Tziotis, M. and Jurewicz, C. (2009). Review of iRAP Risk Parameters. ARRB Group Contract Report for iRAP.

Turner, B., Imberger, K., Roper, P., Pyta, V. and McLean, J. (2010). Road Safety Engineering Risk Assessment Part 6: Crash Reduction Factors. Austroads AP-T151/10. ISBN 978-1-921709-11-1.

University of North Carolina Highway Safety Research Center and U.S. Department of Transportation Federal Highway Administration (2013). Crash Modification Factors Clearing House: <http://www.cmfclearinghouse.org/>.

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