C-46: A case for adopting smaller longitudinal friction factors for Highway Design

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The longitudinal friction factors determine the braking distance component of the stopping sight distance, which is critical on single lane roads specially on crest vertical curves. Different countries have adopted different values for longitudinal friction factors depending on climatic factors, legislative factors and driver practices. Adoption of lower values will result in longer Stopping sight distances and longer vertical curves. Australian values are compared with American values by evaluating the extra earthwork cost against the benefits in reducing the accident cost, of adopting longer crest vertical curves.

A road platform (width including the carriageway and the 2 shoulders) of 13.4m was assumed for the calculations. The gradient change assumed for the specimen calculations shown in the table was 10%. An accident model by Transportation Research Board (USA) and local cost figures for accidents and a hypothetical traffic volume figure of 200 veh/day is used in the calculations.

Comparison of Benefits and Costs

Design Speed (kmph)	Cost of extra cut earth Volume (Rs)	Benefit or annual accident reductions (Rs)
50	11,725	14,669. 11
70	60,300	44,007.34
80	46,900	29,338.23

According to the accident trends prevalent today, improvement of a crest vertical curve to have a longer length would be cost effective after 2-3 years of operation and adopting higher longitudinal friction factors would be dangerous without proper enforcement, legal and driver practices in force. Adopting smaller longitudinal friction factors (of the compared values) is therefore beneficial in the long run.