Pavement widening in curves (VSS1998/081)

**Verbreiterung der Fahrbahn in Kurven**

**Funding:** National (Switzerland)

**Duration:** Nov 1998 - Dec 2001

**Status:** Complete with results

**Background & policy context:**

The standards of the Swiss Association of Road Professionals (VSS) on the subject of pavement widening in curves dates back 20 years. Consequently they do not comply with actual cross-section standards and they basically do not correspond to the group of standards regarding the various types of roads. Thus, a general review of the subject is needed.

Swiss and foreign experiences regarding the actual know-how on pavement widening are being analysed. In particular reference is being made to standards such as the German RAS-L-1995 and the Austrian RVS 3.23 respectively. Particular attention shall be given to the relevance of the following set of parameters:

- Track or pavement widening on the approach to the curve (cross-section design)
- Vehicle categories with similar dragging characteristics in curves
- Probability of vehicle crossings in curves
- Dragging of vehicles in short curves.

The investigation is based on both actual standards for cross-section design and space requirements in curves of the appropriate vehicle categories.

The actual research work comprises a proposal on the revision of the VSS - standard 640 105.

**Objectives:**

Establishing of the fundamentals for updating the standards on the design of pavement widening in curves.

**Parent Programmes:**

[ARAMIS - ARAMIS information system](#)

**Institute type:** Public institution

**Institute name:** Swiss Government: State Secretariat for Education and Research

**Funding type:** Public (national/regional/local)

**Partners:**

Switzerland

Swiss Federal Roads Office

Basler & Hofmann Ingenieure und Planer AG

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**Key Results:**
Key Results:

Conclusions of the project related to calculation of pavement widening

The analysis of domestic and foreign research reveals clearly, that the frequency of in-curve-accidents is higher in general than on straight sections. However, in-curve-accidents may not be related to the width of pavement, provided the width of the approaching road is in accordance to the standards that applies for the specific road category and the perception of the curve is clear.

Thus pavement widening is a function of the specific vehicle dimensions and the geometry of curve only. It shall provide for the additional area being covered by the dragging of the rear parts of the vehicle considered and shall not comprise any additional safety margins whether explicitly nor under cover. The design of pavement widening shall therefore be done according to the largest vehicle relevant for the design of the road project.

The calculation of pavement widening must take in consideration all geometric characteristics of a vehicle driving on a curve. The 'reduced length of cart-shaft" (D) is a vehicle specific dimension and it serves as basis for the computation of pavement widening. The result represents a maximum value, which is needed wherever the total change of direction (F) exceeds the angle of limit (FGrenz). On short curves the maximum value may be reduced accordingly to both the ratio of the reduced length of cart-shaft and the outer radius of curve (D/Ra) and the total change of direction F in centi-degrees. The corresponding percentage (p) is the result of a numeric solution for the differential equation of the trajectory of a vehicle's dragged rear axis running on a circular curve. The computation is in compliance with the procedure being applied in Austrian standards regarding this subject.

Three elements of particular importance are to be considered:

1. Pavement widening must be added on the inner side of the curve, since the application on the outer side would cause undesirable optical effects due to the resulting counter-curve.

2. The accommodation of widening at the beginning of a curve is handled differently on the international level. No doubt, the simplest solution to this problem is a linear transition. However, in case of a major widening with/or a relatively short horizontal curve this procedure may cause visible kinks on the outer edge of carriageway. It is recommended therefore, that previous practice be preserved i.e. the implementation of wid

Technical Implications

Establishing of the fundamentals for updating the standards on the design of pavement widening in curves

Documents:

‑ 20492_484_Inhalt.PDF (Final report)

STRIA Roadmaps: Other specified

Transport mode: Road transport