

Thesis Title Operating Speed Models for Investigating Consistency of Horizontal Alignment on Two-Lane Rural Highways

Author Mr. Surasith Buabarn

Degree Master of Engineering (Civil Engineering)

Thesis Advisor Assoc. Prof. Lamduan Srisakda

ABSTRACT

Consistency check for the design of two-lane highway requires the prediction of operating speeds (V_{85}) on curves and tangents. The objective of this research is to develop models for the prediction of operating speeds on curve and tangent sections of two-lane rural highways, and develop a computer program to perform the consistency check for new road design, improve or realign existing alignments. Operating speeds of passenger cars and pick-ups on 31 curves and 33 straight sections on two routes --- Route No. 107 and 106 --- were observed. The surveys were carried out during daylight hours, in good weather conditions and with a dry pavement, Grades on curves and approach tangents were between ± 4 percent, the headway of at least 5 seconds for free-flow traffic conditions. It was found that curvature change rate (CCR) is the significant variable describing speeds on curves while approach speed to tangent, tangent length (TL) and sight distance available (SD) are significant to speeds on tangents. The operating speed model on curves and on tangents were found to be $V_{85} = 100.623 \times 0.99922^{CCR}$ and $V_{85} = 47.213 + 0.509 V_{85c} + 0.01 SD - 1019.932 / TL$ respectively, where V_{85c} is the V_{85} obtained by using the average value of CCR of the curve leading to and following the tangent. In addition a computer program was written on AutoCAD environment to assist engineer in checking the design consistency of two-lane highways in Thailand.