

*This study aims at developing models to predict the operating speeds of passenger cars on horizontal curves of rural multi-lane highways. A total of 16 compound curves and 35 simple curves located on two major rural multi-lane divided highways in Jordan were selected for the study. Continuous speed data were collected using an affordable (low cost) speedometer application loaded on smartphones equipped with Global Positioning System (GPS) technology. A stepwise multiple linear regression analysis at a 95% confidence interval has been performed to develop the speed prediction models. The obtained model at the beginning of the compound curve indicated that the 85th percentile speed at the midpoint of approach independent tangent and the deflection angle of the first curve is found to be statistically significant to predict operating speed. At both points of the compound curve and end of the curve, the significant variables were the radius of the first curve and the total length of the compound curve. For simple curves, the obtained models indicated that the curve radius and the 85th percentile speed at the midpoint of approach independent tangents were positively correlated with the operating speed at beginning of curve, while the degree of curvature was negatively correlated with the operating speed at both middle and end of the curve.*

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