

## Vehicle Maneuverability on Horizontal Curves on Hilly Terrain: A Study on Shillong Highway

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**Abstract :** The driver has two fundamental duties i) controlling the position of the vehicle along the longitudinal and lateral direction of movement ii) roadway width. Both of these duties are interdependent and are concurrently referred to as two-dimensional driver behavior. One of the main problems facing driver behavior modeling is to identify the parameters for describing the exemplary driving conduct and car maneuver under distinct traffic circumstances. Still, to date, there is no well-accepted theory that can comprehensively model the 2-D driver conduct (longitudinal and lateral). The primary objective of this research is to explore the vehicle's lateral longitudinal behavior in the heterogeneous condition of traffic on horizontal curves as well as the effect of road geometry on dynamic traffic parameters, i.e., car velocity and lateral placement. In this research, with their interrelationship, a thorough assessment of dynamic car parameters, i.e., speed, lateral acceleration, and turn radius. Also, horizontal curve road parameters, i.e., curvature radius, pavement friction, are performed. The dynamic parameters of the various types of car drivers are gathered using a VBOX GPS-based tool with high precision. The connection between dynamic car parameters and curve geometry is created after the removal of noise from the GPS trajectories. The major findings of the research are that car maneuvers with higher than the design limits of speed, acceleration, and lateral deviation on the studied curves of the highway. It can become lethal if the weather changes from dry to wet.

**Keywords :** geometry, maneuverability, terrain, trajectory, VBOX

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