

The Effects of Key Factors in Traffic-Oriented Road Alignment Adjustment for Low Emissions Profile: A Case Study in Norway

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Abstract : Emissions reduction has emerged among the principal targets in the process of planning and designing road alignments today. Intelligent road design methods that can result in optimized alignment constitute concrete and innovative responses towards better alternatives and more sustainable road infrastructures. As the largest amount of emissions of road infrastructures occur in the operation stage, it becomes very important to consider traffic weight and distribution in alignment design process. This study analyzes the effects of four traffic factors (i.e. operating speed, vehicle category, technology and fuel type) on adjusting the vertical alignment of a given road, using optimization techniques. Further, factors' effects are assessed qualitatively and quantitatively, and the emission profiles of resulting alignment alternatives are compared.

Keywords : alignment adjustment, emissions reduction, optimization, traffic-oriented

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