Transportation Project Outcomes Under Uncertainty: Examination of Benefit-Cost Ratios and Other Impacts

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Abstract:

Budget constraints and competing opportunities demand thoughtful project evaluation before investment. Significant uncertainty surrounds travel choices, demographic futures, project costs, and model parameters. The impacts of this uncertainty are explored by conducting hundreds of sensitivity test runs across 28 random parameter sets to evaluate highway capacity expansion and tolling project scenarios in Austin, Texas. The effects of different parameter sets on project benefit-cost ratios, crash counts, emissions, traffic volumes, and tolling revenues are examined in detail. Linear regression results show that link capacity, link-performance parameters—and their covariation—are key to results, followed by the elasticity of demand, trip growth rates and values of travel time.