



## Development of Physical Parameters within Transportation Systems and Their Implications on Traffic Assignment

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### **Abstract**

The majority of transportation engineering design issues include several physical parameters and choice variables as well as multipart objective functions. This study investigates the dynamic evolution of physical parameters intrinsic to transportation systems and evaluates their profound implications on the process of traffic assignment. Through a comprehensive analysis, encompassing a range of transportation modes and infrastructural elements, this research elucidates the nuanced interplay between evolving physical attributes and the distribution of traffic flows. To do this work, this research employs advanced modeling techniques to differentiate the intricate relationships between factors such as capacity constraints, network topology, and mode split, providing valuable insights into the evolving dynamics of transportation systems. Furthermore, this study utilizes empirical data and simulation models to validate and contextualize the findings, ensuring their practical applicability. Also, uncertainties in all methodologies and infeasibility in the applications have been reduced. This research contributes to the field of transportation engineering, planning and management by decoding the multifaceted influences of altering coefficients on traffic assignment. The results hold substantial effects for the design and optimization of transportation networks, informing policies aimed at enhancing transportation system efficiency, resilience, and sustainability in the face of evolving urban environments and transportation demands.

**Keywords:** Transportation Systems, Physical Parameters, Traffic Assignment.

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