Evaluation and analysis of urban passengers transport modes operation performance & efficiency
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Abstract:

While the demand for transportation is growing rapidly, many problems are facing planners and traffic operators in urban areas; such as; low performance and efficiency levels of passengers transport system. The strategy for tackling these problems has been for years to consider adding more capacity to the transport supply system, through huge investments in transport infrastructure. Best utilization of available transport services and facilities is an urgent necessity. Methods developed in the theory of optimization, through making use of advanced computation technology, would allow one to make experimental analysis and evaluation of different policies and strategies for better understanding of the transportation problem and to select a solution for efficient utilization of resources. This paper presents a methodology for transport modes operation analysis for different policies and strategies to be simulated in order to reach optimal goals. The performance and efficiency of transport modes operation are formulated in a framework as an output maximization process of an objective function, subject to state variables, decision variables, constraints and variable bounds. Four main traffic operation strategies which would have great impacts on urban transportation performance and efficiency were analyzed, each strategy contains heuristics of many trial values of decision variables. The overall methodology is seeking global optimality. The research output revealed two important indicators for alternative transport systems evaluation; Mode Efficiency Factor and transport system passenger supply Efficiency Index. The efficient transport system supply that satisfies a certain demand is attained. Moreover, an identification and clarification of most compatible transport modes, suitable for passenger demand sharing, that would give optimal performance indicators are documented.

Keywords:

Urban passengers; Transportation Modes; Optimization; Operation Performance; Operation Efficiency

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