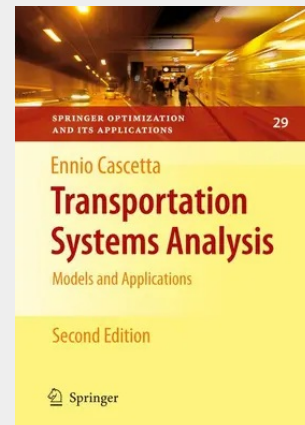


Transportation Systems Analysis

Models and Applications

Science is made of facts just as a house is made of bricks, but a collection of facts is no more science than a pile of bricks is a house. Henri Poincaré
 The aim of the disciplines of praxis is not theoretical knowledge. It is to change the forms of action. Aristotle
 Transportation systems consist not only of the physical and organizational elements that interact with each other to produce transportation opportunities, but also of the demand that takes advantage of such opportunities to travel from one place to another. This travel demand, in turn, is the result of interactions among the various economic and social activities located in a given area. Mathematical models of transportation systems represent, for a real or hypothetical transportation system, the demand flows, the functioning of the physical and organizational elements, the interactions between them, and their effects on the external world. Mathematical models and the methods involved in their application to real, large-scale systems are thus fundamental tools for evaluating and/or designing actions affecting the physical elements (e. g., a new railway) and/or organizational components (e. g., a new timetable) of transportation systems. This book discusses the mathematical models that are used to analyze transportation systems, presenting them as the result of a limited number of general assumptions (theory). It also deals with the methods needed to make these models operational, and with their application to transportation system project design and evaluation. This field of knowledge is known as transportation systems engineering.

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