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Introduction to Traffic Engineering: A Manual for Data Collection and Analysis Elsevier

This book aims at showing how big data sources and data analytics can play an important role in sustainable mobility. It is especially intended to provide academicians, researchers, practitioners and decision makers with a snapshot of methods that can be effectively used to improve urban mobility. The different chapters, which report on contributions presented at the 4th Conference on Sustainable Urban Mobility, held on May 24-25, 2018, in Skiathos Island, Greece, cover different thematic areas, such as social networks and traveler behavior, applications of big data technologies in transportation and analytics, transport infrastructure and traffic management, transportation modeling, vehicle emissions and environmental impacts, public transport and demand responsive systems, intermodal interchanges, smart city logistics systems, data security and associated legal aspects. They show in particular how to apply big data in improving urban mobility, discuss important challenges in developing and implementing analytics methods and provide the reader with an up-to-date review of the most representative research on data management techniques for enabling sustainable urban mobility

Contemporary Challenges of Transport Systems and Traffic Engineering Springer

In recent years the applications of advanced information technologies in the field of transportation have affected both road infrastructures and vehicle technologies. The development of advanced transport telematics systems and the implementation of a new generation of technological options in the transport environment have had a significant impact on improved traffic management, efficiency and safety. This volume contains contributions from scientific and academic centres which have been active in this field of research and provides an overview of applications of AI technology in the field of traffic control and management. The topics covered are: -- current status of AI in transport -- AI applications in traffic engineering -- in-vehicle AI

Traffic Engineering Emerald Group Publishing

Mobility Patterns, Big Data and Transport Analytics provides a guide to the new analytical framework and its relation to big data, focusing on capturing, predicting, visualizing and controlling mobility patterns - a key aspect of transportation modeling. The book features prominent international experts who provide overviews on new analytical frameworks, applications and concepts in mobility analysis and transportation systems. Users will find a detailed, mobility ‘ structural ’ analysis and a look at the extensive behavioral characteristics of transport, observability requirements and limitations for realistic transportation applications and transportation systems analysis that are related to complex processes and phenomena. This book bridges the gap between big data, data science, and transportation systems analysis with a study of big data ’ s impact on mobility and an introduction to the tools necessary to apply new techniques. The book covers in detail, mobility ‘ structural ’ analysis (and its dynamics), the extensive behavioral characteristics of transport, observability requirements and limitations for realistic transportation applications, and transportation systems analysis related to complex processes and phenomena. The book bridges the gap between big data, data science, and Transportation Systems Analysis with a study of big data ’ s impact on mobility, and an introduction to the tools necessary to apply new techniques. Guides readers through the paradigm-shifting opportunities and challenges of handling Big Data in transportation modeling and analytics Covers current analytical innovations focused on capturing, predicting, visualizing, and controlling mobility patterns, while discussing future trends Delivers an introduction to transportation-related information advances, providing a benchmark reference by world-leading experts in the field Captures and manages mobility patterns, covering multiple purposes and alternative transport modes, in a multi-disciplinary approach Companion website features videos showing the analyses performed, as well as test codes and data-sets, allowing readers to recreate the presented analyses and apply the highlighted techniques to their own data

Traffic Engineering Handbook Elsevier

This book presents the selected peer-reviewed papers from the national conference Futuristic Approaches in Civil Engineering (FACE) 2019. This volume focuses on latest research and challenges in the field of geotechnical, transportation, environmental and water resources engineering. The first part focuses on alternative and sustainable pavement materials, maintenance and rehabilitation of roads, transportation planning, traffic engineering, hybrid vehicles, safety management, and intelligent transport systems. In the second part of the book, basic and advanced research in geotechnical engineering which can provide sustainable solutions to practical problems in

foundations, retaining structures, soil dynamics, site characterization, slope stability, dams, rock engineering, environmental geotechnics, and geosynthetics are covered. The third part of the book includes current research in environment, and water resources engineering. The contents of this book will be useful for students, researchers as well as industry professionals.

Data Analytics for Intelligent Transportation Systems Springer Nature

Emerging Paradigms in Urban Mobility: Planning, Finance and Implementation explains the types of new urban mobility planning paradigms that are emerging throughout the world, along with their potential to transform the transportation landscape. As half of the world's 7 billion people now live in cities, thus causing severe road congestion, increased air pollution, energy insecurity and sustainability problems in cities and the planet itself, this book presents new paradigms that are emerging to address these problems, along with other topics of note, including economic efficiency, health, the well-being of cities and their residents, urban mobility transformations, and the role of social media. In addition, the book looks at Integrated Corridor Management and how it improves the people-moving performance of multi-modal transport systems in high demand urban corridors and how countries balance the mobility benefits of motorcycles with the environmental and safety threats they pose. Provides previously unpublished research on new approaches to integrating governance, the changing role of IT, and shared mobility initiatives Links transportation and land use, climate change, and poverty reduction and gender, going well beyond the technical issues of transport planning Highlights successful factors that have worked and how they can be tailored to different contexts Includes learning aids, such as case studies, text boxes and chapter openers and summaries

Artificial Intelligence Applications to Traffic Engineering VSP

Understanding data-driven transportation science is essential for addressing the newest challenges in the quickly developing intelligent transportation systems. Data-Driven Transportation Science explores the fundamental principle of analysing different types of transportation-related data using methodologies such as data fusion model, big data mining approach, computer vision-enabled traffic sensing data analysis, and machine learning. The book examines the state-of-the-art in data-enabled methodologies, technologies, and applications in transportation. The book helps readers solve such transportation systems problems as energy efficiency under connected vehicle environment, urban travel behavior, trajectory data based travel pattern identification, public transportation analysis, traffic signal control efficiency, optimizing traffic networks network, and much more Synthesizes the newest developments in data-driven transportation science Includes case studies and examples in each chapter that illustrate the application of methodologies and technologies employed Useful for both theoretical and technical oriented researchers

Traffic and Highway Engineering, SI Edition Elsevier

Highly regarded for its clarity and depth of coverage, the bestselling Principles of Highway Engineering and Traffic Analysis provides a comprehensive introduction to the highway-related problems civil engineers encounter every day. Emphasizing practical applications and up-to-date methods, this book prepares students for real-world practice while building the essential knowledge base required of a transportation professional. In-depth coverage of highway engineering and traffic analysis, road vehicle performance, traffic flow and highway capacity, pavement design, travel demand, traffic forecasting, and other essential topics equips students with the understanding they need to analyze and solve the problems facing America's highway system. This new Seventh Edition features a new e-book format that allows for enhanced pedagogy, with instant access to solutions for selected problems. Coverage focuses exclusively on highway transportation to reflect the dominance of U.S. highway travel and the resulting employment opportunities, while the depth and scope of coverage is designed to prepare students for success on standardized civil engineering exams.

Logic-Driven Traffic Big Data Analytics Springer

This book is a collation of numerous valuable guidelines for making decisions based on recent advances and improvement of transport systems. Offering know-how and discussing practical examples as well as decision-making support systems it is of interest of those who face the challenge of seeking solutions to contemporary transport system problems on a daily basis, including local authorities involved in planning and preparation of development strategies for specific transport related areas (in both urban and regional dimension) as well as representatives of business and industry who participate directly in the implementation of traffic engineering solutions. The guidelines are provided in individual chapters, making it possible to address the given problem in an advanced manner and simplify the choice of appropriate strategies (including those related to increasing competitiveness of public transport; identifying bus lines to potentially be serviced by electric buses; pedestrian traffic solutions; developing bike-sharing systems; safety conditions in road tunnels; integrating supply chains or route planning support by means of technologically advanced systems and applications). On the other hand, since the book also addresses the new approach to theoretical models (including traffic flow surveys and measurements, transport behaviours, capacity models, delay modelling and road condition modelling), it appeals to researchers and scientists studying this body of problems. The book entitled Recent Advances in Traffic Engineering for Transport Networks and Systems includes selected papers submitted to and presented at the 14th Scientific and Technical Conference "Transport Systems. Theory and Practice" organised by the Department of Transport Systems and Traffic Engineering at the Faculty of Transport of the Silesian University of Technology. The conference was held on 18–20 September 2017 in Katowice (Poland).

Nodes in Transport Networks – Research, Data Analysis and Modelling Cengage Learning

This textbook provides a comprehensive and instructive coverage of vehicular traffic flow dynamics and modeling. It makes this fascinating interdisciplinary topic, which to date was only documented in parts by specialized monographs, accessible to a broad readership. Numerous figures and problems with solutions help the reader to quickly understand and practice the presented concepts. This book is targeted at students of physics and traffic engineering and, more generally, also at students and professionals in computer science, mathematics, and interdisciplinary topics. It also offers material for project work in programming and simulation at college and university level. The main part, after presenting different categories of traffic data, is devoted to a mathematical description of the dynamics of traffic flow, covering macroscopic models which describe traffic in terms of density, as well as microscopic many-particle models in which each particle corresponds to a vehicle and its driver. Focus chapters on traffic instabilities and model calibration/validation present these topics in a novel and systematic way. Finally, the theoretical framework is shown at work in selected applications such as traffic-state and travel-time estimation, intelligent transportation systems, traffic operations management, and a detailed physics-based model for fuel consumption and emissions.

Safe Mobility Springer Science & Business Media

The publication delivers numerous valuable guidelines, particularly useful when making decisions related in the subject matter to road and rail nodes located in dense transport networks. The know-how displayed while discussing practical examples as well as the decision making support systems described in the publication will certainly attract the interest of those who daily face the challenge of seeking solutions to the operational and functional problems of transport nodes in contemporary transport networks and systems. This publication is dedicated to local

authorities involved in planning and preparation of development strategies for specific transport-related issues (in both urban and regional areas) as well as to representatives of business and industry, being those who participate directly in the implementation of traffic engineering solutions. The guidelines provided in individual chapters of the publication will make it possible to address the given problem in an advanced manner and simplify the choice of appropriate strategies (including those related to synchronisation of road traffic streams, improving the capacity, road traffic safety analysis, evaluation of changes in drivers' behaviour on account of introducing countdown timers at signal-controlled intersections using UAV data, the influence of the type of traffic organisation on the behaviour of pedestrians at tram line crossings). On the other hand, since the publication also concerns the new approach to theoretical models (including potential places of integration of public transport with the railway network or the speed adviser for pedestrians enabling them to choose the optimal path at signal-controlled intersections), it should also attract the attention of researches and scientists studying this body of problems. The publication entitled "Nodes in transport networks - research, data analysis and modelling" contains selected papers submitted to and presented at the 16th "Transport Systems. Theory and Practice" Scientific and Technical Conference organized by the Department of Transport Systems and Traffic Engineering at the Faculty of Transport of the Silesian University of Technology. The conference was held on 16-18 September 2019 in Katowice (Poland).

Multi-agent Systems for Traffic and Transportation Engineering Springer Nature

This book describes, analyzes, and recommends traffic engineering (TE) and quality of service (QoS) optimization methods for integrated voice/data dynamic routing networks. These functions control a network's response to traffic demands and other stimuli, such as link failures or node failures. TE and QoS optimization is concerned with measurement, modeling, characterization, and control of network traffic, and the application of techniques to achieve specific performance objectives. The scope of the analysis and recommendations include dimensioning, call/flow and connection routing, QoS resource management, routing table management, dynamic transport routing, and operational requirements. Case studies are included which provide the reader with a concrete way into the technical details and highlight why and how to use the techniques described in the book. Includes Case Studies of MPLS and GMPLS Network Optimization Presents state-of-the-art traffic engineering and quality of service optimization methods and illustrates the tradeoffs between the various methods discussed Contains practical Case Studies based on large-scale service provider implementations and architecture plans Written by a highly respected and well known active expert in traffic engineering and quality of service

Data-Driven Traffic Engineering Cengage Learning

Data-Driven Solutions to Transportation Problems explores the fundamental principle of analyzing different types of transportation-related data using methodologies such as the data fusion model, the big data mining approach, computer vision-enabled traffic sensing data analysis, and machine learning. The book examines the state-of-the-art in data-enabled methodologies, technologies and applications in transportation. Readers will learn how to solve problems relating to energy efficiency under connected vehicle environments, urban travel behavior, trajectory data-based travel pattern identification, public transportation analysis, traffic signal control efficiency, optimizing traffic networks network, and much more. Synthesizes the newest developments in data-driven transportation science Includes case studies and examples in each chapter that illustrate the application of methodologies and technologies employed Useful for both theoretical and technically-oriented researchers

Traffic & Highway Engineering IGI Global

The publication contains numerous valuable guidelines one will find particularly useful while making decisions concerning development and improvement of transport systems. It provides a multitude of case studies connected with diverse problems of both technical and organisational nature. The knowledge displayed while discussing practical examples as well as the decision making support systems described in the publication will certainly attract interest of those who face the challenge of seeking solutions to problems of contemporary transport systems on a daily basis. Consequently, this publication is dedicated to local authorities involved in planning and preparation of development strategies for specific transport related areas (in both urban and regional dimension) as well as to representatives of business and industry, being those who participate directly in the implementation of traffic engineering solutions. The guidelines provided in individual chapters of the publication will make it possible to address the given problem in a technologically advanced manner and simplify the choice of appropriate strategies (including those related to increasing competitiveness of public transport, integration of supply chains or route planning support by means of technologically advanced systems and applications). On the other hand, since the publication also concerns the new approach to theoretical models (including travel models, capacity models, road condition modelling and speed-volume relationship), it will raise interest among researches and scientists studying this body of problems. The publication entitled Contemporary Challenges of Transport Systems and Traffic Engineering contains selected papers submitted to and presented at the 13th "Transport Systems. Theory and Practice" Scientific and Technical Conference organised by the Department of Transport Systems and Traffic Engineering at the Faculty of Transport of the Silesian University of Technology. The conference was held on 19-21 September 2016 in Katowice (Poland). More details at www.TSTP.polsl.pl

Principles of Highway Engineering and Traffic Analysis Springer

Research leading to the continuous improvement of traffic analysis techniques depends on the ongoing collection of data relating to driver behavior. INTRODUCTION TO TRAFFIC ENGINEERING: A MANUAL FOR DATA COLLECTION AND ANALYSIS is meant to aid both the student of traffic engineering and the transportation professional in sound data collection and analysis methods. It presents step-by-step techniques for several traffic engineering topics. Each topic is introduced in a consistent manner, and data collection and analysis forms are provided for each study. Studies are organized to facilitate inclusion in a formal transportation engineering report. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Modern Traffic Engineering in the System Approach to the Development of Traffic Networks "O'Reilly Media, Inc."

This book presents a state-of-the-art survey of technologies, algorithms, models, and experiments in the area quality of Internet service. It is based on the European Action COST 263 Quality of Future Internet Services, which involved 70 researchers during a period of almost five years. The results presented in the book reflect the state of the art in the area beyond the Action COST 263. The six comprehensive chapters are written by teams of leading researchers in the area; a roadmap outlines and summarizes the overall situation and indicates future developments. The book offers chapters on traffic managements, quality of service routing, Internet traffic engineering, mobile networking, algorithms for scalable content distribution, and pricing and QoS.

Computational Models, Software Engineering, and Advanced Technologies in Air

Transportation: Next Generation Applications Elsevier
This book offers a collection of valuable guidelines for making decisions concerning the future development of transport networks and traffic engineering. The decision-making support systems described here will certainly attract the interest of those who face the challenge of finding solutions to problems concerning modern transport systems on a daily basis. Consequently, the book is chiefly intended for local authorities involved in planning and preparing development strategies for specific transport-related areas (in both urban and regional contexts), as well as for representatives of business and industry who are directly engaged in the implementation of traffic engineering solutions. The guidelines provided in the respective chapters help to address the given problem soundly, and to simplify the selection of an appropriate strategy. The topics covered include increasing the competitiveness of public transport, the status quo of electric vehicle infrastructures worldwide, methods for calming urban traffic as an element of sustainable transport development, speed traffic zones and electric buses, car-sharing systems in Poland, a method for deconstructing the regional travel demand model, monitoring urban traffic using floating car data, problems of deliveries in urban agglomeration distribution systems, estimating the number of threatened people in case of fire in road tunnels, and road pavement evaluation using advanced tools. Since the book also considers new approaches to theoretical models (including traffic flow surveys and measurements, transport behaviors, human factors in traffic engineering, and road condition modeling), it will also appeal to researchers and scientists studying these problems. The book gathers selected papers presented at the 15th Scientific and Technical Conference “Transport Systems. Theory and Practice”, organized by the Department of Transport Systems and Traffic Engineering, Silesian University of Technology in Katowice, Poland on September 17–19, 2018.
Nodes in Transport Networks – Research, Data Analysis and Modelling Springer Nature
This book starts from the relationship between urban built environment and travel behavior and focuses on analyzing the origin of traffic phenomena behind the data through multi-source traffic big data, which makes the book unique and different from the previous data-driven traffic big data analysis literature. This book focuses on understanding, estimating, predicting, and optimizing mobility patterns. Readers can find multi-source traffic big data processing methods, related statistical analysis models, and practical case applications from this book. This book bridges the gap between traffic big data, statistical analysis models, and mobility pattern analysis with a systematic investigation of traffic big datas impact on mobility patterns and urban planning.
Traffic Engineering IGI Global
Get a complete look into modern traffic engineering solutions Traffic Engineering Handbook, Seventh Edition is a newly revised text that builds upon the reputation as the go-to source of essential traffic engineering solutions that this book has maintained for the past 70 years. The updated content reflects changes in key industry standards, and shines a spotlight on the needs of all users, the design of context-sensitive roadways, and the development of more sustainable transportation solutions. Additionally, this resource features a new organizational structure that promotes a more functionally-driven, multimodal approach to planning, designing, and implementing transportation solutions. A branch of civil engineering, traffic engineering concerns the safe and efficient movement of people and goods along roadways. Traffic flow, road geometry, sidewalks, crosswalks, cycle facilities, shared lane markings, traffic signs, traffic lights, and more—all of these elements must be considered when designing public and private sector transportation solutions. Explore the fundamental concepts of traffic engineering as they relate to operation, design, and management Access updated content that reflects changes in key industry-leading resources, such as the Highway Capacity Manual (HCM), Manual on Uniform Traffic Control Devices (MUTCD), AASSHTO Policy on Geometric Design, Highway Safety Manual (HSM), and Americans with Disabilities Act Understand the current state of the traffic engineering field Leverage revised information that homes in on the key topics most relevant to traffic engineering in today's world, such as context-sensitive roadways and sustainable transportation solutions Traffic Engineering Handbook, Seventh Edition is an essential text for public and private sector transportation practitioners, transportation decision makers, public officials, and even upper-level undergraduate and graduate students who are studying transportation engineering.
Traffic Flow Dynamics John Wiley & Sons
Highway Safety Analytics and Modeling comprehensively covers the key elements needed to make effective transportation engineering and policy decisions based on highway safety data analysis in a single. reference. The book includes all aspects of the decision-making process, from collecting and assembling data to developing models and evaluating analysis results. It discusses the challenges of working with crash and naturalistic data, identifies problems and proposes well-researched methods to solve them. Finally, the book examines the nuances associated with safety data analysis and shows how to best use the information to develop countermeasures, policies, and programs to reduce the frequency and severity of traffic crashes. Complements the Highway Safety Manual by the American Association of State Highway and Transportation Officials Provides examples and case studies for most models and methods Includes learning aids such as online data, examples and solutions to problems
Highway Safety Analytics and Modeling IGI Global
Get a complete look into modern traffic engineering solutions Traffic Engineering Handbook, Seventh Edition is a newly revised text that builds upon the reputation as the go-to source of essential traffic engineering solutions that this book has maintained for the past 70 years. The updated content reflects changes in key industry standards, and shines a spotlight on the needs of all users, the design of context-sensitive roadways, and the development of more sustainable transportation solutions. Additionally, this resource features a new organizational structure that promotes a more functionally-driven, multimodal approach to planning, designing, and implementing transportation solutions. A branch of civil engineering, traffic engineering concerns the safe and efficient movement of people and goods along roadways. Traffic flow, road geometry, sidewalks, crosswalks, cycle facilities, shared lane markings, traffic signs, traffic lights, and more—all of these elements must be considered when designing public and private sector transportation solutions. Explore the fundamental concepts of traffic engineering as they relate to operation, design, and management Access updated content that reflects changes in key industry-leading resources, such as the Highway Capacity Manual (HCM), Manual on Uniform Traffic Control Devices (MUTCD), AASSHTO Policy on Geometric Design, Highway Safety Manual (HSM), and Americans with Disabilities Act Understand the current state of the traffic engineering field Leverage revised information that homes in on the key topics most relevant to traffic engineering in today's world, such as context-sensitive roadways and sustainable transportation solutions Traffic Engineering Handbook, Seventh Edition is an essential text for public and private sector transportation practitioners,

transportation decision makers, public officials, and even upper-level undergraduate and graduate students who are studying transportation engineering.