Albedo A Measure Of Pavement Surface Reflectance Acpa

Visualizing Weather and Climate Change will capture the reader's interest in weather and climate and then use that interest to engage them in activities that demonstrate the science that serves as the basis of the discipline. Sections such as Eye on the Atmosphere use beautiful imagery to help them see the atmosphere through the eyes of a meteorologist and ask scientific questions that place significant features in atmospheric context. It also includes expanded coverage of global change and recent phenomena. Chapter summaries, self-tests and critical thinking questions help prepare readers for quizzes and tests while the illustrated case studies offer a wide variety of in-depth examinations that address important issues in the field of environmental science.

The full-color, practical guide to designing sustainable residential landscapes and small-scale sites "Going green" is no longer a choice; it's a necessity. Developed landscapes have played a significant role in exacerbating the environmental and social problems that threaten humanity; however, they can also be part of the solution. Designing the Sustainable Site: Integrated Design Strategies for Small-Scale Sites and Residential Landscapes gives site designers and landscape architects the tools and information they need to become a driving force in the quest for sustainability. Advocating a regenerative design approach in which built landscapes sustain and restore vital ecological functions, this book guides readers through a design process for new and redeveloped sites that not only minimizes damage to the environment but also actively helps to repair it. Designing the Sustainable Site: Assists designers in identifying and incorporating sustainable practices that have the greatest positive impact on both the project and the surrounding community, within a regional context Uses photographs, sketches, and case studies to provide a comprehensive look at successful green landscape design Illustrates how sustainable practices are relevant and applicable to projects of any size or budget Demonstrates how built environments can protect and restore ecosystem services Explains the multiple and far-reaching benefits that sustainable design solutions can provide Assists project teams in fulfilling credit requirements of green building assessment tools, such as LEED, BREEAM, or SITES With attention to six global environmental challenges—including air pollution, urban flooding and water pollution, water shortages, invasive species, and loss of biodiversity—along with guidance on how to meet these challenges, Designing the Sustainable Site is a practical design manual for sustainable alternatives to small-scale site and residential landscape design.

Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements contains 124 papers from 14 different countries which were presented at the 5th International Symposium on Frontiers of Road and Airport Engineering (IFRAE 2021, Delft, the Netherlands, 12-14 July 2021). The contributions focus on research in the areas of "Circular, Sustainable and Smart Airport and Highway Pavement" and collects the state-of-the-art and state-of-practice areas of long-life and circular materials for sustainable, cost-effective smart airport and highway pavement design and construction. The main areas covered by the book include: • Green and sustainable pavement materials • Recycling technology • Warm & cold mix asphalt materials • Functional pavement design • Self-healing pavement materials • Eco-efficiency pavement materials • Pavement preservation, maintenance and rehabilitation • Smart pavement materials and structures • Safety technology for smart roads • Pavement monitoring and big data analysis • Role of transportation engineering in future pavements Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements aims at researchers, practitioners, and administrators interested in new materials and innovative technologies for achieving sustainable and renewable pavement materials and design methods, and for those involved or working in the broader field of pavement engineering.

The aim of this special volume is to give an overview of the historical background and present status of eco-materials processing and design for materials research, and to foresee future trends in the field. Serious global and environmental problems have led the materials manufacturing industries to monitor closely the formation and accumulation of carbon dioxide and other deleterious gases in the atmosphere, as well to reduce raw materials use and energy consumption and limit other factors which reflect the environmental impact of the industry.Volume is indexed by Thomson Reuters CPCI-S (WoS). The papers contained within cover topics such as room- and low-temperature synthesis, low-energy processing, aqueous synthesis and processing, the re-use and recycling of waste materials and the elimination of such hazardous materials as cadmium, mercury, lead and chromium which are restricted in use, in electronic components and automobile parts, under the European Committee RoHS guidelines. It is shown how the materials industries

have addressed environmental concerns by investing in research on various novel materials in order to ensure safer and cleaner systems and processes.This thorough coverage will certainly make the book essential reading for all of those who care about conserving the world for the benefit of future generations. Addressing environmental concern within the materials manufacturing industries, the January 2009 symposium explores low-temperature synthesis, low-energy processing, aqueous synthesis and processing, the reuse and recycling of waste materials, and the elimination of such hazardous materials as cadmium, mercury, lead, and 6-valence chromium. The Asian contributors share recent research on high-performance materials, hybrid composites, nanostructure materials, biomaterials, photocatalysts, multifunction of materials, and porous materials. Topics of the 195 papers include adding gneiss to asphalt concrete mixtures, characterization of power plant bottom ash, the effects of filler on the properties of silicone rubber, the fabrication of clay foam ceramics, and the use of recycled calcium slag for clean steel refining.

A Life-cycle Assessment Approach

Constructed Climates

Pavement Materials for Heat Island Mitigation

Urban Heat Island (UHI) Mitigation

Visualizing Weather and Climate

The Thermal and Radiative Characteristics of Concrete Pavements in Mitigating Urban Heat Island Effects

Eco-efficient Pavement Construction Materials

Fundamentals of radiation for atmospheric applications -- Solar radiation at the top of the atmosphere -- Absorption and scattering of solar radiation in the atmosphere -- Thermal infrared radiation transfer in the atmosphere -- Light scattering by atmospheric particulates -- Principles of radiative transfer in planetary atmospheres -- Application of radiative transfer principles to remote sensing -- Radiation and climate.

This Special Issue "Recent Advances and Future Trends in Pavement Engineering" was proposed and organized to present recent developments in the field of innovative pavement materials and engineering. The 12 articles and state-of-the-art reviews highlighted in this editorial are related to different aspects of pavement engineering, from recycled asphalt pavements to alkali-activated materials, from hot mix asphalt concrete to porous asphalt concrete, from interface bonding to modal analysis, and from destructive testing to non-destructive pavement monitoring by using fiber optics sensors. This Special Issue partly provides an overview of current innovative pavement engineering ideas that have the potential to be implemented in industry in the future, covering some recent developments.

An increasing number of agencies, academic institutes, and governmental and industrial bodies are embracing the principles of sustainability in managing their activities. Life Cycle Assessment (LCA) is an approach developed to provide decision support regarding the environmental impact of industrial processes and products. LCA is a field with ongoing research, development and improvement and is being implemented world-wide, particularly in the areas of pavement, roadways and bridges. Pavement, Roadway, and Bridge Life Cycle Assessment 2020 contains the contributions to the International Symposium on Pavement, Roadway, and Bridge Life Cycle Assessment 2020 (Davis, CA, USA, June 3-6, 2020) covering research and practical issues related to pavement, roadway and bridge LCA, including data and tools, asset management, environmental product declarations, procurement, planning, vehicle interaction, and impact of materials, structure, and construction. Pavement, Roadway, and Bridge Life Cycle Assessment 2020 will be of interest to researchers, professionals, and policymakers in academia, industry, and government who are interested in the sustainability of pavements, roadways and bridges.

International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies publishes a wide spectrum of research and technical articles as well as reviews, experiments, experiences, modelings, simulations, designs, and innovations from engineering, sciences, life sciences, and related disciplines as well as interdisciplinary/cross-disciplinary/multidisciplinary subjects. Original work is required. Article submitted must not be under consideration of other publishers for publications.

Materials for Sustainable Sites

Pavements and the Environment

Principles of Pavement Design

Sustainable Landscaping

Eco-efficient Materials for Mitigating Building Cooling Needs

Recent Advances and Future Trends in Pavement Engineering

Theory and Applications

This complete guide to the evaluation, selection, and use of sustainable materials in the landscape features strategies to minimize environmental and human health impacts of conventional site construction materials as well as green materials. Providing detailed current information on construction materials for sustainable sites, the book introduces tools, techniques, ideologies and resources for evaluating, sourcing, and specifying sustainable site materials. Chapters cover types of materials, both conventional and emerging green materials, environmental and human health impacts of the material, and detailed strategies to minimize these impacts. Case studies share cost and performance information and lessons learned.

This book brings together scientific experts in different areas that contribute to the railway track and transportation engineering challenges, evaluate the state of the art, identify the shortcomings and opportunities for research, and promote the interaction with the industry. In particular, scientific topics that are addressed in this book include railway ballasted track degradation/settlement problems and stabilization/reinforcement technologies, switches and crossings and related derailments causes, train-induced vibrations and mitigation measures, operations, management, and performance of ground transportation, and traffic congestion and safety procedures.

Presents a complete coverage of all aspects of the theory and practice of pavement design including the latest concepts.

This book is devoted to the analysis and applications of energy, exergy, and environmental issues in all sectors of the economy, including industrial processes, transportation, buildings, and services. Energy sources and technologies considered are hydrocarbons, wind and solar energy, fuel cells, as well as thermal and electrical storage. This book provides theoretical insights, along with state-of-the-art case studies and examples and will appeal to the academic community, but also to energy and environmental professionals and decision makers.

Recent Developments in Pavement Engineering

Proceedings of the 5th International Symposium on Asphalt Pavements & Environment (APE)

Tree Roots in the Built Environment

LEED-NC for New Construction

Environmental Impact Statement

Climate-Responsive Design for Asian Mega-Cities

Climate Change, Energy, Sustainability and Pavements

The proliferation of technological capability, miniaturization, and demand for aerial intelligence is pushing unmanned aerial systems (UAS) into the realm of a multi-billion dollar industry. This book surveys the UAS landscape from history to future applications. It discusses commercial applications, integration into the national airspace system (NAS), System function, operational procedures, safety concerns, and a host of other relevant topics. The book is dynamic and well-illustrated with separate sections for terminology and web- based resources for further information.

This collection contains 87 papers presented at the 2006 Airfield and Highway Pavements Specialty Conference, held in Atlanta, Georgia, April 30-May 3, 2006.

The main objective of this research study was to provide understanding, supporting documentation, and tools on how pavement designs and materials selection contribute to surface and subsurface temperature fluctuations. This objective was achieved through two focus areas that outlined the scope of work of this research: thermal properties and reflectance evaluation, and heat absorption and transfer modeling. In the first focus area, the reflectance "albedo" characteristics of various concrete pavement surfaces / mix types were identified. Surface and in-depth pavement temperatures of several field sections were collected to help validate modeling efforts. Perhaps one of the most notable accomplishments in this focus area was the development of a simplified laboratory test procedure to measure the thermal conductivity of paving materials using cylindrical specimens. Laboratory tests were also conducted to measure key thermal properties of the different paving materials. These properties were used as input parameters for the pavement heat absorption and transfer model. In the second focus area, a pavement heat absorption and transfer model was developed and validated. This fundamental model accounts for the surface rates of solar radiation absorption and heat transmission of various pavements designs. It can be used for comparative evaluation for the different pavements designs in mitigating the Urban Heat Island Effect. The outcome of the two focus areas outlined above are envisioned to play a key role aiding future decision makers and designers when choosing appropriate pavement materials for their particular application. It will provide further awareness of urban heat island, and drives further municipal ordinances and building codes that incorporate environmentally appropriate materials into development and rehabilitation projects.

Climate change, energy production and consumption, and the need to improve the sustainability of all aspects of human activity are key inter-related issues for which solutions must be found and implemented quickly and efficiently. To be successfully implemented, solutions must recognize the rapidly changing socio-techno-political environment and multi-dimensional constraints presented by today’s interconnected world. As part of this global effort, considerations of climate change impacts, energy demands, and incorporation of sustainability concepts have increasing importance in the design, construction, and maintenance of highway and airport pavement systems. To prepare the human capacity to develop and implement these solutions, many educators, policy-makers and practitioners have stressed the paramount importance of formally incorporating sustainability concepts in the civil engineering curriculum to educate and train future civil engineers well-

equipped to address our current and future sustainability challenges. This book will prove a valuable resource in the hands of researchers, educators and future engineering leaders, most of whom will be working in multidisciplinary environments to address a host of next-generation sustainable transportation infrastructure challenges. "This book proposes a broad detailed overview of the actual scientific knowledge about pavements linked to climate change, energy and sustainability at the international level in an original multidimensional/multi-effects way. By the end, the reader will be aware of the whole global issues to care about for various pavement technical features around the world, among which the implications of modelling including data collection, challenging resources saving and infrastructures services optimisation. This is a complete and varied work, rare in the domain." Dr. Agnes Jullien Research Director Director of Environmental, Development, Safety and Eco-Design Laboratory (EASE) Department of Development, Mobility and Environment Ifsttar Centre de Nantes Cedex- France “An excellent compilation of latest developments in the field of sustainable pavements. The chapter topics have been carefully chosen and are very well-organized with the intention of equipping the reader with the state-of-the-art knowledge on all aspects of pavement sustainability. Topics covered include pavement Life Cycle Analysis (LCA), pervious pavements, cool pavements, photocatalytic pavements, energy harvesting pavements, etc. which will all be of significant interest to students, researchers, and practitioners of pavement engineering. This book will no doubt serve as an excellent reference on the topic of sustainable pavements.” Dr. Wei-Hsing Huang Editor-in-Chief of International Journal of Pavement Research and Technology (IJPRT) and Professor of Civil Engineering National Central University Taiwan

Energy-efficient Community Development in California : Chula Vista

Principles and Practices

The Role of Exergy in Energy and the Environment

Reference Guide

Introduction to Unmanned Aircraft Systems, Second Edition

Selected Peer Reviewed Papers from the 10th International Symposium on Eco-Materials Processing and Design, ISEPD, Xian, China, January 13-15, 2009

Pavement, Roadway, and Bridge Life Cycle Assessment 2020

This volume highlights the latest advances, innovations, and applications in the field of asphalt pavement technology, as presented by leading international researchers and engineers at the 5th International Symposium on Asphalt Pavements & Environment (ISAP 2019 APE Symposium), held in Padua, Italy on September 11-13, 2019. It covers a diverse range of topics concerning materials and technologies for asphalt pavements, designed for sustainability and environmental compatibility: sustainable pavement materials, marginal materials for asphalt pavements, pavement structures, testing methods and performance, maintenance and management methods, urban heat island mitigation, energy harvesting, and Life Cycle Assessment. The contributions, which were selected by means of a rigorous international peer-review process, present a wealth of exciting ideas that will open novel research directions and foster multidisciplinary collaboration among different specialists.

Eco-efficient Pavement Construction Materials acquaints engineers with research findings on new eco-efficient pavement materials and how they can be incorporated into future pavements. Divided into three distinctive parts, the book emphasizes current research topics such as pavements with recycled waste, pavements for climate change mitigation, self-healing pavements, and pavements with energy harvesting potential. Part One considers techniques for recycling, Part Two reviews the contribution of pavements for climate change mitigation, including cool pavements, the development of new coatings for high albedo targets, and the design of pervious pavements. Finally, Part Three focuses on self-healing pavements, addressing novel materials and design and performance. Finally, the book discusses the case of pavements with energy harvesting potential, addressing different technologies on this field. Offers a clear and concise lifecycle assessment of asphalt pavement recycling for greenhouse gas emission with temporal aspects Applies key research trends to green the pavement industry Includes techniques for recycling waste materials, the design of cool pavements, self-healing mechanisms, and key steps in energy harvesting

This publication sets out a comprehensive review of tree root biology and covers a broad range of practical issues that need to be considered in order to grow trees successfully in our towns and cities and to realise the significant benefits they provide in built environments. Topics covered include: soil condition and roots; improving tree root growth in urban soils; water supply and drought amelioration for amenity trees; coping with soil contamination; protecting trees during excavation and good trenching practice; control of damage to tree roots on construction sites; tree root damage to buildings and pavements, sewers, drains and pipes; research needs and sustainability issues.

This study demonstrates the value of urban green. Focusing specifically on the role of vegetation and trees, the book shows the costs and benefits reaped from urban open spaces, from cooler temperatures to better quality ground water - and why it all matters. While a work of science, the book does not ignore the social component: it looks at low-income areas that have poor vegetation, and shows how enhancing these areas through the planting of community gardens and trees can alleviate social ills.

Hearing Before the Subcommittee on Technology and Innovation, Committee on Science and Technology, House of Representatives, One Hundred Tenth Congress, Second Session, June 24, 2008

Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements

Trinity Parkway, from IH-35E/SH-183 to US-175/SH-310, Dallas County

Meeting Today's Challenges with Emerging Technologies : Proceedings of the 2006 Airfield and Highway Pavement Specialty Conference, April 30-May 3, 2006, Atlanta, Georgia
New Construction Reference Guide Version 2.2
Proceedings of the Symposium on Life-Cycle Assessment of Pavements (Pavement LCA 2017), April 12-13, 2017, Champaign, Illinois, USA
Designing the Sustainable Site

While landscaping has the potential to be part of the solution to certain environmental problems, the quest for beauty can also produce effects that are harmful to the environment. Sustainable Landscaping: Principles and Practices examines landscape practices that adversely affect the environment, which occur in the process of constructing, implementing, and managing residential and commercial landscapes. It explores ways to change these practices to have a more positive effect, describing the principles of sustainable landscaping and proposing solutions to challenges that can arise. This book covers a wide range of landscape practices that fall under the broad subject of sustainability, providing detailed coverage of principles including the following: Conducting sustainability audits Using plants to maximize their benefits Regulating solar heat gain and loss with seasonal climate changes Directing wind using plants to minimize heat loss in winter and maintain cooling breezes in summer Addressing water quantity and quality Managing storm water Understanding and improving soil health Minimizing the impact of pesticides and herbicides Conserving energy and reducing air pollution Managing resources and reducing waste Each topic is introduced by providing background information and terminology, followed with practical solutions that are being implemented by landscape professionals. Written for a general audience–from students of landscaping to homeowners and professionals in the landscaping industry–this book provides background information and practical solutions, offering sustainable approaches to the way landscapes are designed and managed.

Maximizing readers ’ insights into urban and architectural environmental planning with consideration for the thermal environment, this work highlights how various urban heat-island strategies have been developed and their effectiveness in urban areas. Specific measures to combat the urban heat-island phenomenon, including improvement of surface cover, reduction of exhaust heat, improvement of ventilation are summarized and various heat-island measurement technologies, which have been proposed in recent years, are organized systematically based on surface- heat budget and surface boundary layer models. With suggestions for the selection of appropriate heat-island technologies depending on the location, this book elucidates the relationship between the thermal environment and urban block form characteristics. Covering the latest research findings, this book is of interest for all those concerned with environmentally friendly urban and architectural planning.

This book discusses the concepts and technologies associated with the mitigation of urban heat islands (UHIs) that are applicable in hot and humid regions. It presents several city case studies on how UHIs can be reduced in various areas to provide readers, researchers, and policymakers with insights into the concepts and technologies that should be considered when planning and constructing urban centres and buildings. The rapid development of urban areas in hot and humid regions has led to an increase in urban temperatures, a decrease in ventilation in buildings, and a transformation of the once green outdoor environment into areas full of solar-energy-absorbing concrete and asphalt. This situation has increased the discomfort of people living in these areas regardless of whether they occupy concrete structures. This is because indoor and outdoor air quality have both suffered from urbanisation. The development of urban areas has also increased energy consumption so that the occupants of buildings can enjoy indoor thermal comfort and air quality that they need via air conditioning systems. This book offers solutions to the recent increase in the number of heat islands in hot and humid regions.

About 90 percent of this excessive heat is due to buildings and pavements that absorb and store solar heat (According to the Green Buildings Council). The only reference that focuses specifically on pavements, Pavement Materials for Heat Island Mitigation: Design and Management Strategies explores different advanced paving materials, their properties, and their associated advantages and disadvantages. Relevant properties of pavement materials (e.g. albedo, permeability, thermal conductivity, heat capacity and evaporation rate) are measured in many cases using newly developed methods. Includes experimental methods for testing different types of pavements materials Identifies different cool pavement strategies with their advantages and associated disadvantages Design and construct local microclimate models to evaluate and validate different cool pavement materials in different climate regions

Reference Guide, Version 2.2
High-Rise Urban Form and Microclimate
ITJEMAST 11(1) 2020
Airfield and Highway Pavements
Hot and Humid Regions
Eco-materials Processing and Design X
Proceedings of the 3rd GeoMEast International Congress and Exhibition, Egypt 2019 on Sustainable Civil Infrastructures - The Official International Congress of the Soil-Structure Interaction Group in Egypt (SSIGE)

"This book will be the official reference guide to Sustainable Sites Initiative Rating System, the first national rating system for sustainable landscapes"--

The urban climate is continuously deteriorating. Urban heat lowers the quality of urban life, increases energy needs, and affects the urban socio-economy. Urban Climate Mitigation Techniques presents steps that can be taken to mitigate this situation through a series of innovative technologies and examples of best practices for the improvement of the urban climate. Including tools for evaluation and a comparative analysis, this book addresses anthropogenic heat, green areas, cool materials and pavements, outdoor shading structures, evaporative cooling and earth cooling. Case studies demonstrate the success and applicability of these measures in various cities throughout the world. Useful for urban designers, architects and planners, Urban Climate Mitigation Techniques is a step by step tour of the innovative technologies improving our urban climate, providing a holistic approach supported by well-established quantitative examples.

With superior fire resistance, strength, and a long service life, concrete is the most widely used construction material in the world. A sustainable material, concrete is also easily and affordably reused and rehabilitated. The first book to provide an overview of sustainability and concrete, Green Building with Concrete: Sustainable Design and Construction surveys the material’s history in the green building movement and presents state-of-the-art methodologies and best practices. From the manufacturing of cement to the rehabilitation of concrete, this comprehensive book explains how concrete can be used for sustainable design and construction. It offers insight into new technological and social developments guiding

the introduction of green buildings and examines the attributes that concrete has to offer the green building movement. The text also highlights research on economic analysis—particularly life cycle costing—to provide a full picture of the economic benefits of concrete. Expert contributors from around the world offer diverse viewpoints on global sustainability. Topics covered include: Principles of sustainable design Benefits of concrete’s thermal mass Mitigation of urban heat island effects Surface runoff and the application of pervious concrete for sidewalks and parking areas Reduction of construction waste Leadership in energy and environmental design (LEED) standards Emphasizing environmental impact and occupational and consumer health and safety, this book explains how to make the most of concrete in sustainable design. Written for university and concrete industry continuing education courses, it also serves as a reference for building owners and industry professionals who recognize the value of green building.

Climate change is one of the most important environmental problems faced by Planet Earth. The majority of CO2 emissions come from burning fossil fuels for energy production and improvements in energy efficiency shows the greatest potential for any single strategy to abate global greenhouse gas (GHG) emissions from the energy sector. Energy related emissions account for almost 80% of the EU's total greenhouse gas emissions. The building sector is the largest energy user responsible for about 40% of the EU’s total final energy consumption. In Europe the number of installed air conditioning systems has increased 500% over the last 20 years, but in that same period energy cooling needs have increased more than 20 times. The increase in energy cooling needs relates to the current higher living and working standards. In urban environments with low outdoor air quality (the general case) this means that in summer-time one cannot count on natural ventilation to reduce cooling needs. Do not forget the synergistic effect between heat waves and air pollution which means that outdoor air quality is worse in the summer aggravating cooling needs. Over the next few years this phenomenon will become much worse because more people will live in cities, more than 2 billion by 2050 and global warming will aggravate cooling needs. An overview of materials to lessen the impact of urban heat islands Excellent coverage of building materials to reduce air condtioning needs Innovative products discussed such as Thermo and Electrochromic materials

Pavimentazioni stradali in calcestruzzo

A Complete Guide to the Principles, Strategies, and Best Practices for Sustainable Landscapes

Design and Management Strategies

Proceedings of the 5th International Symposium on Frontiers of Road and Airport Engineering, 12-14 July, 2021, Delft, Netherlands (IFRAE)

Design, Properties and Applications

Visible Light Communications

Integrated Design Strategies for Small Scale Sites and Residential Landscapes

The book comprehensively investigates the relationship between critical urban form and fabric parameters and urban microclimate in the high-rise urban environment that prevails in Asian megacities such as Shanghai. It helps readers gain a deeper understanding of climate-responsive urban design strategies and tactics for effectively mitigating the negative impacts of deteriorating urban thermal environments on pedestrian thermal comfort, outdoor air quality and building energy consumption. It also reviews the latest advances in urban climate research, with a focus on the challenges in terms of outdoor space comfort, health, and livability posed by the high-rise and high-density development in emerging Asian megacities, and proposes an integrated framework in response to the pressing need for microclimate research. It then presents a series of studies on high-rise residential and non-residential urban neighborhoods and districts based on instrumented field study, validated numerical simulation, and spatial analysis using a GIS platform. The book includes extensive, valuable experimental data presented in a clear and concise manner. The thermal atlas methodology based on empirical modeling and spatial analysis described is a useful climate-responsive design tool for both urban designer and architects. As such, the book is of particular interest to researchers, professionals, and graduate students in the fields of urban planning and design, building science and urban climatology.

Visible Light Communications, written by leading researchers, provides a comprehensive overview of theory, stimulation, design, implementation, and applications. The book is divided into two parts – the first devoted to the underlying theoretical concepts of the VLC and the second part covers VLC applications. Visible Light Communications is an emerging topic with multiple functionalities including data communication, indoor localization, 5G wireless communication networks, security, and small cell optimization. This concise book will be of valuable interest from beginners to researchers in the field.

An increasing number of agencies, academic institutes, and governmental and industrial bodies are embracing the principles of sustainability in managing their activities and conducting business. Pavement Life-Cycle Assessment contains contributions to the Pavement Life-Cycle Assessment Symposium 2017 (Champaign, IL, USA, 12-13 April 2017) and discusses the current status of as well as future developments for LCA implementation in project- and network-level applications. The papers cover a wide variety of topics: - Recent developments for the regional inventory databases for materials, construction, and maintenance and rehabilitation life-cycle stages and critical challenges - Review of methodological choices and impact on LCA results - Use of LCA in decision making for project selection - Implementation of case studies and lessons learned: agency perspectives - Integration of LCA into pavement management systems (PMS) - Project-level LCA implementation case studies - Network-level LCA applications and critical challenges - Use-phase rolling resistance models and field validation - Uncertainty assessment in all life-cycle stages - Role of PCR and EPDs in the implementation of LCA Pavement Life-Cycle Assessment will be of interest to academics, professionals, and policymakers involved or interested in Highway and Airport Pavements.

A Primer on Urban Environments

Green Building with Concrete

Proceedings of the International Symposium on Pavement. Roadway, and Bridge Life Cycle Assessment 2020 (LCA 2020, Sacramento, CA, 3-6 June 2020)

Commercial Interiors, Version 2.0

PIER Final Project Report

Sustainable Design and Construction

Sustainable, Energy-efficient Transportation Infrastructure