"Resilient modulus indicates the stiffness of a soil under controlled confinement conditions and repeated loading. The test is intended to simulate the stress conditions that occur in the base and subgrade of a pavement system. Resilient modulus has been adopted by the U.S. federal highway administration as the primary performance parameter for pavement design. We thank those who prepared these papers, the reviewers who provided anonymous peer reviews, and those who participated in the symposium. We hope this STP encourages more work to improve the testing standard and the value of the Resilient Modulus test."


This title includes a number of Open Access chapters. This new book takes a nuanced look at building a sustainable transportation infrastructure and provides an overview of the harmful effect of various modes of transportation on the environment. The environmental impact of transportation is significant. Transportation is a major user of energy, it burns most of the world's petroleum, and is the fastest-growing contributor to carbon dioxide emissions. Although environmental regulations in many countries have reduced the individual vehicle's emissions, this has been offset by an increase in vehicles on the road and airways.

Bearing Capacity of Roads, Railways and Airfields includes the contributions to the 10th International Conference on the Bearing Capacity of Roads, Railways and Airfields (BCARRA 2017, 28-30 June 2017, Athens, Greece). The papers cover aspects related to materials, laboratory testing, design, construction, maintenance and management systems of transport infrastructure, and focus on roads, railways and airfields. Additional aspects that concern new materials and characterization, alternative rehabilitation techniques, technological advances as well as pavement and railway track substructure sustainability are included. The contributions discuss new concepts and innovative solutions, and are concentrated but not limited on the following topics: · Unbound aggregate materials and soil properties · Bound materials characteristics, mechanical properties and testing · Effect of traffic loading · In-situ measurements techniques and monitoring · Structural evaluation · Pavement serviceability condition · Rehabilitation and maintenance issues · Geophysical assessment · Stabilization and reinforcement · Performance modelling · Environmental challenges · Life cycle assessment and sustainability Bearing Capacity of Roads, Railways and Airfields is essential reading for academics and professionals involved or interested in transport infrastructure systems, in particular roads, railways and airfields.

Transportation and Public Health: An Integrated Approach to Policy, Planning, and Implementation helps current and future transportation professionals integrate public health considerations into their transportation planning, thus supporting sustainability and promoting societal health and well-being. The book defines key issues, describes potential solutions, and provides detailed examples of how solutions have been implemented worldwide. In addition, it demonstrates how to identify gaps in existing policy frameworks. Addressing a critical and emerging urgent need in transportation and public health research, the book creates a coherent, inclusive and interdisciplinary framework for understanding. By integrating principles from transportation planning and engineering, health management, economics, social and organizational psychology, the book deepens understanding of these multiple perspectives and tensions inherent in integrating public health and transportation planning and policy implementation. Bridges the gap between
transport and public health, two fields that have traditionally traveled on separate and parallel tracks Synthesizes key research and practice literature Includes teaching and learning aids, such as case studies, chapter objectives, summaries and discussion questions

Connie Kelly Tang and Lei Zhang have provided a holistic coverage of the entire surface transportation project and program development process from the beginning of planning through environmental approval, design, right-of-way acquisition, construction to operations and maintenance.— Neil Pedersen, Executive Director, Transportation Research Board, National Academies of Sciences, Engineering, and Medicine, Washington, DC Transportation program and project development is complex. The process spans over planning, programming, environment, design, right of way, construction, operations, and maintenance. Professionals from civil engineering, planning, social and environmental sciences, business and project management, and data science, work together in a relay team to transform an idea into a highway, a transit hub, an airport or a water facility. It is challenging for any one person to master all the knowledge and skills needed to perform every relevant task. However, it is critical for all involved to understand how this relay works and how the societal, environmental, governmental, and regulatory contexts influence the process and the technical solution. Professionals who understand the process and see the big picture are those who rise to the top as leaders. Transportation Project and Program Development provides holistic coverage on the technical subject matter, processes and procedures, and policy and guidance associated with transportation project and program development, which can help professionals become program leaders. For each phase of the process, key products delivered, processes used, governing principles, foundations of applicable science and engineering, technologies deployed, and knowledge required are discussed. While all coverages reflect the practices of the United States, the logic, principles, science, and engineering are applicable to all countries of the world. The book can also serve as an introductory textbook for undergraduate students and as a textbook or reference for a graduate-level course in civil engineering, transportation engineering, planning, and project management.

This review book has all the problems and solutions you need to review for the transportation engineering portion of the “Professional Engineer (PE) exam for Civil Engineering. This is for engineers planning to take the “Civil Engineering PEexam in transportation. The chapters are taken from the “Civil Engineering License Review and “Civil Engineering License Problems and Solutions. The review book contains the complete review of the topics and includes example questions with step-by-step solutions and end-of-chapter practice problems. Also featured is information from the latest “Codes-1998 Highway Capacity Manual. There are 15 problems with complete step-by-step solutions.

This document presents concepts for enhancing safety in the operation and management of highways. It presents good design and operational practices for numerous design elements and situations for all types of roads.

"This report completes and updates the first edition of NCHRP Report 600: Human Factors Guidelines for Road Systems (HFG), which was published previously in three collections. The HF G contains guidelines that provide human factors principles and findings for consideration by, and is a resource document for, highway designers, traffic engineers, and other safety practitioners."--Foreword.

This second edition of Concrete Pavement Design, Construction, and Performance provides a solid foundation for pavement engineers seeking relevant and applicable design and construction instruction. It relies on general principles instead of specific ones, and incorporates illustrative case studies and prime design examples to highlight the material. It presents a thorough understanding of materials selection, mixture proportioning, design and detailing, drainage, construction techniques, and pavement performance. It also offers insight into the theoretical framework underlying commonly used design procedures as well as the limits of the applicability of the procedures. All chapters have been updated to reflect recent developments, including some alternative and emerging design technologies that improve sustainability. What’s New in the Second Edition: The second edition of this book contains a new chapter on sustainability, and coverage of mechanistic-empirical design and pervious concrete pavements. RCC pavements are now given a new chapter. The text also expands the industrial pavement design chapter. Outlines alternatives for concrete pavement solutions Identifies desired performance and behavior parameters Establishes appropriate materials and desired concrete proportions Presents steps for translating the design into a durable facility The book highlights significant innovations such as one is two-lift concrete pavements, precast concrete pavement systems, RCC pavement, interlocking concrete pavers, thin concrete pavement design, and pervious concrete. This text also addresses pavement management, maintenance, rehabilitation, and overlays.

The Code of Federal Regulations is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

Gain a stronger foundation with optimal ground improvement Before you break ground on a new structure, you need to analyze the structure of the ground. Expert analysis and optimization of the geo-materials on your site can mean the difference between a lasting structure and a school in a sinkhole. Sometimes problematic geology is expected because of the location, but other times it’s only unearthed once construction has begun. You need to be able to quickly adapt your project plan to include an improvement to unfavorable ground before the project can safely continue. Principles and Practice of Ground Improvement is the only comprehensive, up-to-date compendium of solutions to this critical aspect of civil engineering. Dr. Jie Han, registered Professional Engineer and preeminent voice in geotechnical engineering, is the ultimate guide to the methods and best practices of ground improvement. Han walks you through various ground improvement solutions and provides theoretical and practical advice for determining which technique fits each situation. Follow examples to find solutions to complex problems Complete homework problems to tackle issues that present themselves in the field Study design
The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the United States Federal Government.

This interim report presents the findings of the initial literature review, a description of traffic data requirements for the M-E Design Guide for the Design of New and Rehabilitated Pavement Structures, and a preliminary sensitivity analysis conducted under typical Texas environmental conditions.

"The increased use of underground space for transportation systems and the increasing complexity and constraints of constructing and maintaining above ground transportation infrastructure have prompted the need to develop this technical manual. This FHWA manual is intended to be a single-source technical manual providing guidelines for planning, design, construction and rehabilitation of road tunnels, and encompasses various types of road tunnels"—P. ix.

Explore the Art and Science of Geometric Design The Geometric Design of Roads Handbook covers the design of the visible elements of the road—its horizontal and vertical alignments, the cross-section, intersections, and interchanges. Good practice allows the smooth and safe flow of traffic as well as easy maintenance. Geometric design is covered in depth. The book also addresses the underpinning disciplines of statistics, traffic flow theory, economic and utility analysis, systems analysis, hydraulics and drainage, capacity analysis, coordinate calculation, environmental issues, and public transport. Background Material for the Practicing Designer A key principle is recognizing what the driver wishes to do rather than what the vehicle can do. The book takes a human factors approach to design, drawing on the concept of the "self-explaining road." It also emphasizes the need for consistency of design and shows how this can be quantified, and sets out the issues of the design domain context, the extended design domain concept, and the design exception. The book is not simply an engineering manual, but properly explores context-sensitive design. Discover and Develop Real-World Solutions Changes in geometric design over the last few years have been dramatic and far-reaching and this is the first book to draw these together into a practical guide which presents a proper and overriding philosophy of design for road and highway designers, and students. This text: Covers the basics of geometric design Explores key aspects of multimodal design Addresses drainage and environmental issues Reviews practical standards, procedures, and guidelines Provides additional references for further reading A practical guide for graduate students taking geometric design, traffic operations/capacity analysis, and public transport, the Geometric Design of Roads Handbook introduces a novel approach that addresses the human aspect in the design process and incorporates relevant concepts that can help readers create and implement safe and efficient designs.

Modern highway engineering reflects an integrated view of a road system's entire lifecycle, including any potential environmental impacts, and seeks to develop a sustainable infrastructure through careful planning and active management. This trend is not limited to developed nations, but is recognized across the globe. Edited by renowned authority

This comprehensive design guide summarizes current developments in the design of concrete pavements. Following an overview of the theory involved, the authors detail optimum design techniques and best practice, with a focus on highway and infrastructure projects. Worked examples and calculations are provided to describe standard design methods, illustrated with numerous case studies. The author provides guidance on how to use each method on particular projects, with reference to UK, European and US standards and codes of practice. Concrete Pavement Design Guidance Notes is an essential handbook for civil engineers, consultants and contractors involved in the design and construction of concrete pavements, and will also be of interest to students of pavement design.

Addressing the intelligent concepts of the ancient endeavour of road design, this book discusses how a road alignment optimization model can be developed and applied in real case studies. Based on research in intelligent road design and alignment optimization, it is suitable for road planners, designers, senior undergraduate and graduate students.

Pavement Engineering will cover the entire range of pavement construction, from soil preparation to structural design and life-cycle costing and analysis. It will link the concepts of mix and structural design, while also placing emphasis on pavement evaluation and rehabilitation techniques. State-of-the-art content will introduce the latest concepts and techniques, including ground-penetrating radar and seismic testing. This new edition will be fully updated, and add a new chapter on systems approaches to pavement engineering, with an emphasis on sustainability, as well as all new downloadable models and simulations.

Special edition of the Federal Register, containing a codification of documents of general applicability and future effect with ancillaries.
This book presents new studies dealing with the attempts made by the scientists and practitioners to address contemporary issues in geotechnical engineering such as characterization of soil, geomaterials, soil stability and some other geomechanics issues that are becoming quite relevant in today’s world. Papers were selected from the 5th GeoChina International Conference on Civil Infrastructures Confronting Severe Weathers and Climate Changes: From Failure to Sustainability, held on July 23-25, 2018 in HangZhou, China.

More than 40,000 people are killed on our highways each year, and millions more are injured. Bad drivers and bad vehicles alone do not account for this carnage. The highway itself is often a contributing -- even determining -- cause of accidents. Killer Roads provides comprehensive guidance on the many issues surrounding transportation facility negligence. It helps you pinpoint essential engineering issues and relevant road defects, assess the quality of maintenance, identify pertinent engineering standards, and understand the liability of all parties. However, Killer Roads goes beyond describing the legal basis for your courtroom strategy. It also provides helpful, hands-on guidance for implementing this strategy successfully. Written in straightforward language, Killer Roads demonstrates how highway liability issues impact your approach to jury selection, the opening statement, cross-examination, and expert witness testimony.

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