

| | |
|-------------------------|---|
| 1. Record Nr. | UNINA9910957183803321 |
| Titolo | Toward infrastructure improvement : an agenda for research // Committee for an Infrastructure Technology Research Agenda, Building Research Board, Geotechnical Board, Commission on Engineering and Technical Systems, National Research Council |
| Pubbl/distr/stampa | Washington, DC, : National Academy Press, 1994 |
| ISBN | 1-280-21098-2 9786610210985 0-309-57332-7 0-585-08480-7 |
| Edizione | [1st ed.] |
| Descrizione fisica | xiii, 129 p. : ill |
| Collana | Studies in infrastructure technology and policy |
| Altri autori (Persone) | GouldJames P LemerAndrew C |
| Disciplina | 363.6 |
| Soggetti | Infrastructure (Economics) - United States Public works - United States |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | "James P. Gould, Andrew C. Lemer, editors." Committee chairman: James P. Gould. Funding was provided by the National Science Foundation. |
| Nota di bibliografia | Includes bibliographical references. |
| Nota di contenuto | Toward Infrastructure Improvement -- Copyright -- Contents -- EXECUTIVE SUMMARY -- INFRASTRUCTURE AS A SYSTEM -- INFRASTRUCTURE RESEARCH AND THE NSF'S ROLE -- NICHE OPPORTUNITIES -- RESEARCH LEADING TO INFRASTRUCTURE IMPROVEMENT -- 1 INTRODUCTION -- RESEARCH AS AN INSTRUMENT FOR IMPROVING INFRASTRUCTURE -- THE STUDY AND ITS ORIGIN -- THE SCOPE OF INFRASTRUCTURE -- THE BENEFITS OF INFRASTRUCTURE RESEARCH -- GUIDING PRINCIPLES -- STRUCTURE OF THE REPORT -- NOTES -- 2 THE CONTEXT AND STATUS OF U.S. INFRASTRUCTURE RESEARCH -- U.S. SPENDING ON INFRASTRUCTURE R&D -- RESEARCHERS AND RESEARCH INSTITUTIONS -- Government Laboratories -- Academic Institutions -- Professional, Industry, And Trade Institutes -- International Activities -- PRIOR STUDIES OF RESEARCH NEEDS -- THE NSF'S ROLE IN INFRASTRUCTURE RESEARCH -- |

THE NICHE AREAS -- NOTES -- 3 Systems Life-Cycle Management -- INFRASTRUCTURE DEMAND AND SERVICE-LIFE MANAGEMENT -- Issues Of Public Goods Demand, Prices, And Costs -- Managing Derived Demand -- Infrastructure As A Life-Cycle Production Process -- Assessing Consequences Of Materials Innovation -- TOTAL SYSTEM INVENTORY, MONITORING, AND MANAGEMENT -- Analytical Inventories Of Infrastructure Systems -- Statistical Analyses And Benchmarking⁵ of Infrastructure -- Deviations-Detection Systems For Public Health And Safety -- Quicker Response Infrastructure Management -- Infrastructure Junction Points And Common-Use Corridors -- Private And Public Interface In Infrastructure -- STANDARDS, REGULATIONS, AND OTHER EXTERNAL INFLUENCES -- Shifts In Design And Management Objectives -- New Approaches To Siting And Technology Decisions -- NOTES -- 4 ANALYSIS AND DECISION TOOLS -- SYSTEMS MODELS -- Ex Post Analysis Of Planning And Design Methods -- Demand/Capacity Analysis -- FASTER INTEGRATION OF NEW TECHNOLOGY INTO DESIGN PRACTICE. ANTICIPATING CONSEQUENCES OF CATASTROPHIC EVENTS -- Construction Effects On Lifeline Systems -- Emergency Infrastructure Operations Procedures -- 5 INFORMATION MANAGEMENT -- ADVANCED DATA ACQUISITION AND MANAGEMENT METHODS -- Remote-Satellite Imagery -- Improved Use of SCADA -- NETWORK ANALYSIS METHODS -- Aggregation And Disaggregation Methods -- Intermodal Interactions -- EDUCATION FOR INFRASTRUCTURE MANAGEMENT -- Using Information Highways -- Uses of Multi-Media -- NOTE -- 6 CONDITION ASSESSMENT AND MONITORING TECHNOLOGY -- NONDISRUPTIVE, NONDESTRUCTIVE, CONDITION-MONITORING TECHNIQUES -- Structural Assessment -- Site Characterization -- SYSTEM-WIDE CONDITION ASSESSMENT -- ENVIRONMENTAL FACTORS AND MANAGEMENT OF RESIDUALS -- Chemical Grouting -- Management of Infrastructure Waste and Residuals -- NOTES -- 7 SCIENCE OF MATERIALS PERFORMANCE AND DETERIORATION -- HIGH-PERFORMANCE MATERIALS -- Polymers -- Geosynthetics -- Other High-Performance Material Applications -- CHARACTERIZATION OF DAMAGE, DETERIORATION, AND AGING -- Limit States And Failure Criteria -- Time-Dependent Deformation And Strength -- Cost-Effectiveness Assessment -- NOTES -- 8 CONSTRUCTION EQUIPMENT AND PROCEDURES -- HIGH-PERFORMANCE CONSTRUCTION TECHNIQUES -- Improved Information Exchange -- Off-Site Pre-Fabrication -- Resource Scheduling -- CONSTRUCTION WASTE DISPOSAL -- Dredge Spoil -- Characterization and Assessment of Contaminated Sites -- Dry Construction Waste -- UNDERGROUND CONSTRUCTION -- Automated Tunneling -- Trenchless Technology -- Hazards Mitigation -- Construction Effects on Adjacent Facilities -- CONSTRUCTION SAFETY -- REHABILITATION AND RETROFIT -- System Isolation -- Access to Degraded Segments -- DECOMMISSIONING -- Temporary Facilities -- Network Devolution -- PROCUREMENT AND MANAGEMENT PRACTICES -- Contracting Practices -- Project Management Tools -- NOTES. 9 TECHNOLOGY MANAGEMENT -- ACHIEVING HIGH PERFORMANCE -- Defining and Measuring Performance -- Incorporating Externalities -- Emergency Procedures -- TECHNOLOGY ADAPTATION TO INFRASTRUCTURE -- Technology Compatibility Assessment -- Analysis of Technology Markets -- INSTITUTIONAL OBSTACLES TO INNOVATION -- Criteria and Standards -- Impact of Procurement Methods -- Performance/Cost Trade-Offs Under Uncertainty -- RESEARCH-TO-INNOVATION PROCESS -- NOTES -- 10 RESEARCH LEADING TO INFRASTRUCTURE IMPROVEMENT -- NOTES -- REFERENCES --

Acronyms -- A BIOGRAPHICAL SKETCHES OF COMMITTEE MEMBERS AND STAFF -- STAFF -- B PROSPECTUS -- A STUDY OF PHYSICAL INFRASTRUCTURE TECHNOLOGY RESEARCH FOR THE TWENTY-FIRST CENTURY -- NOTES -- C WORKSHOP ON INFRASTRUCTURE TECHNOLOGY RESEARCH NEEDS JUNE 2-3, 1993 WORKSHOP PARTICIPANTS -- CHAIRMAN -- MEMBERS -- INVITED GUESTS -- STAFF -- D METHODOLOGY EMPLOYED IN THE STUDY -- E SPECIFIC TECHNOLOGIES -- DIGITAL CONTROLS AND "INTELLIGENT" URBAN AREAS -- PHOTOVOLTAIC ENERGY PRODUCTION -- PNEUMATIC TUBE TRANSPORT -- SUPERCONDUCTIVITY FOR INFRASTRUCTURE APPLICATIONS -- AUTOMATED AIRPORT OPERATIONS.

Sommario/riassunto

This book advises the federal government on a national infrastructure research agenda. It takes the position that the traditional disciplinary and institutional divisions among infrastructure modes and professions are largely historical artifacts that impose barriers to the development of new technology and encourages the government to embrace a more interdisciplinary approach. In order to be practical, the study focuses on infrastructure technologies that can be incorporated into or overlay current systems, allow for alternative future alternative future urban development, and are likely to have value cutting across the distinct functional modes of infrastructure. Finally, the report is organized according to seven broad cross-cutting areas that should promote interdisciplinary approaches to infrastructure problems: systems life-cycle management, analysis and decision tools, information management, condition assessment and monitoring technology, the science of materials performance and deterioration, construction equipment and procedures, and technology management.
