



## **Handbook of Research on E-Planning: ICTs for Urban Development and Monitoring**

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This edited book presents 23 chapters with 454 pages of literatures and case studies on the use of information and communication technologies in urban planning, development and monitoring. With its nomenclature E-Planning, the book provides a comprehensive and in depth elaboration on the theory, concept, methods and tools of the current practices of E-Planning worldwide. It is a very useful text for students, professionals, academics and government officers interested in learning and understanding about how different forms of E-Planning research have been developed and used.

Urban planning has experienced numerous changes in its long history but none seems so challenging, for planners and other urban stakeholders, as the methodological revolution associated with the use of information and communication technologies (ICT) in all stages of the planning process. E-Planning, the name given to the new planning paradigm that is emerging in association with the extensive use of information and communication technologies, especially the Internet, geographic information systems and virtual reality technologies, entails a move from a paper based urban planning system, described in this handbook as conventional urban planning, to one based primarily on the integration of various new information and communication technologies and on the interaction of multiple urban stakeholders, referred here as e-planning. Although being this, perhaps, the most visible difference between conventional urban planning and e-planning, the new urban planning paradigm, this move away from a paper based practice, must be seen as more than a simple transfer to a computer system of the traditional paper based routines, requiring also the re-

engineering of procedures, the development of a full ICT integrated back office and, more important of all, changes in the nature and purpose of urban planning.

The term e-planning is used here as synonymous of e-government or digital government applied to the field of urban and regional planning. Like these others terms, e-planning is also employed in the literature as a fairly broad multi-dimensional concept (digital terminology is still far from consensus and other definitions of e-planning can be found in the literature). It refers to urban planning, either as part of a hierarchical oriented form of urban government or as an activity co-initiated and co-coordinated by citizens and other private and public stakeholders within the overall urban governance network. In the literature the term e-planning is often employed to refer other more specific subcategories, such as e-urban management, e-urban services, etc., or categories specified according to the dominant technology used, as those associated with the concepts of ubiquitous government and mobile government. Like conventional urban planning, e-planning is also regarded as an interdisciplinary research field.

Based on this broad and multidimensional concept of e-Planning, the purpose of this handbook is to explore the nature and to examine the impacts of the transformations in the urban planning field that result from the use of information and communication technologies in all phases of the urban planning process and to raise new questions for further research. However, it is not intended to be an exhaustive coverage of themes that make up the field of e-planning, since numerous other critical issues were not included. For that reason readers will certainly find at the end that there is much ground yet to be explored and researched on the theory, ethics, methodology and practice of e-planning.

Students, scholars, researchers and practitioners interested to become familiar with new concepts, methods and technologies applied in e-planning, with innovative approaches to improve citizen participation through the Internet, as well as with ground-breaking planning e-tools, will find here an accessible, updated, and research focused reference. Readers will find in these empirical studies practical guidance on how to do cutting edge research on e-planning and useful ideas for the design of new methods of citizen e-participation in urban planning as well.

The handbook is divided into three interrelated sections. The first section deals with theories and methods in e-Planning. The second is devoted to citizen participation in e-Planning. The last section provides an overview of innovations in specific sectors within the urban planning field. It goes without saying that some of the themes of these essays are interrelated and for that reason they could fall into more than one of these three sections. The 23 chapters of this handbook cover a wide range of issues on the

theory, methods and tools of e-planning, which make it a useful source for different types of readers. It brings together a collection of multidisciplinary studies, on the many faces of e-Planning, written by 41 distinguished scholars and researchers from leading universities, research institutions, or specialized institutions, from 14 countries, with different perspectives about what e-planning is, representing to some extent the diversity of perspectives and methodologies that can be found in the e-planning field around the world.

Each chapter is divided into six parts: (1) an introduction that provides a general perspective of the chapter and of its main objectives; (2) a background providing broad definitions and discussions of the topic, based on a literature review of the issues discussed, as well as the author's perspective about these issues, controversies, and problems. When appropriate, this part also includes a discussion of solutions and recommendations of the problems presented by the author; (3) a section on future research directions where future and emerging trends are discussed and when appropriate also suggestions for future research within the topic discussed in the chapter; (4) a conclusion with a discussion of the overall coverage of the chapter and concluding remarks; (5) a reference and further readings section, and, finally, (6) a list of terms and definitions applied in the chapter.

Section One, titled "Theory and methods in e-Planning", begins with an overview of e-planning followed by seven chapters. These chapters describe and discuss different planning methodologies, based on the use of information and communication technologies in different planning contexts, exploring key facets of the move towards a new paradigm of urban planning.

Chapter 1, "The e-Planning Paradigm – Theory, Methods and Tools: An Overview", serves as the introduction to the book and discusses the relationships between planning theories and the use of information and communication technologies in urban planning. The way information and communication technologies tools are incorporated by the different planning perspectives is considered to be in part responsible for the different forms of contemporary urban planning.

The role of information technologies, particularly internet based geographic information systems, as decision support systems to aid public participatory planning, is examined in the chapter 2 "Planning online: a community-based interactive decision-making model". Tan Yigitcanlar also discusses the challenges and opportunities for the use of internet based mapping application and tools in collaborative decision-making, introducing a prototype internet based geographic information system that was developed to integrate public oriented interactive decision mechanisms into urban planning practice.

In "Modelling and Matching and Value Sensitive Design: Two Methodologies for e-Planning Systems Development", Yun Chen, Andy Hamilton, and Alan Borning explore two methodologies which can help address the knowledge gap in the methodologies for designing e-Planning systems. Planned to address the needs of diverse user groups and multi-disciplinary cooperation for systems development, these two methodologies offer operational guidance to e-Planning systems developers.

In Chapter 4, "The future-making assessment approach as a tool for e-planning and community development: the case of Ubiquitous Helsinki", Liisa Horelli and Sirkku Wallin, offer readers an in-depth look at an evaluation approach to be used in e-Planning, called the Future-making assessment (FMA), to assist in the monitoring and provision of feedback in the implementation of e-Planning.

The question of the role of the Internet in the production of planning knowledge is addressed by Aija Staffans, Heli Rantanen, and Pilvi Nummi in the Chapter 5, "Local Internet Forums. Interactive land use planning and urban development in neighbourhoods". The authors describe the results of a research project that tried to gather and to combine local information and knowledge on urban planning through Internet forums. They show that local, place-based knowledge is highly fragmented and that it is difficult to combine informal and formal information and knowledge in urban planning.

The next two chapters look at the use of 3-D images as a method of communicating information in urban planning. In Chapter 6, "Does computer game experience influence visual scenario assessment of urban recreational paths? A case study using 3-D computer animation", Arne Aramberger and Thomas Reichhart explain the results of a study in which they used a computer-animated choice model to investigate the influence of computer game experience on respondents' preferences for an urban recreational trail, concluding that the individual experience with computer gaming and the presentation mode influence the evaluation of trail scenarios. Markus Jobst, Jürgen Döllner and Olaf Lubanski, in "Communicating geoinformation effectively with virtual 3D city models", focus on Virtual 3-D city models and how they can enhance the communication between different urban stakeholders. The authors discuss key aspects of virtual 3-D city creation, the main components of virtual environments, the framework for an efficient communication, and explore future research for the creation of virtual 3-D environments.

The last chapter in Section One, "Political power, governance, and e-Planning", analyse the construction of a mega geospatial database for the Hajj, the annual Muslim Pilgrimage to Makkah, Saudi Arabia. Kheir Al-Kodmany discusses this complex process, including in his analysis the influence of top-down political power on the



planning process for the Hajj. The chapter provides transferable and useful lessons on GIS application in spatial urban planning, as well as insights on how and when political power may help in advancing the planning process.

Section two, titled "Citizen Participation in E-Planning", with nine chapters, introduces readers to a range of experiences and practices of e-participation, in different countries and contexts, which provides a good illustration of how citizen participation in the urban planning decision-making process is changing, and the type of challenges faced by planners and planning departments.

Herbert Kubicek, through a comprehensive review of the literature, examines in Chapter 9, "The potential of e-participation in urban planning: a European perspective", different cases of public participation and argues that the electronic mode of participation by itself will not change the low levels of public participation in urban planning, suggesting that it will be necessary to include these new electronic forms of participation within the formal planning processes and in the respective participation procedures, arguing that if citizens are not interested to participate in the urban planning process, they will not take part only because they could do it via the Internet. The author reveals that ICT tools for citizen participation in urban planning will not substitute the traditional forms of public participation in the near future, arguing that it is necessary to combine both, offering specific recommendations for that.

Next, Domenico Camarda in his chapter "Beyond citizen participation in planning: Multi-agent systems for complex decision-making" examines how to set up cooperative multi-agent systems, and discusses the potentials of multi-agent system for complex decision-making in public participation processes in urban planning.

In "The e-Citizen in Planning: U.S. Municipalities' Views of Who Participates Online", Maria Manta Conroy and Jennifer Evans-Cowley examine how online participation tools, regarded as a component of e-government, provide a potential venue for enhancing citizen participation in the urban planning process. However, as e-government participation raises challenges pertaining to trust, exclusion, and responsiveness, the chapter examines how municipalities in the U.S. view the e-participant, concluding that municipal officials view these online tools as a means to advance efficiency and citizen satisfaction, rather than as a means by which to potentially enhance discussion of community issues.

In Chapter 12, "Planners support of e-participation in the field of urban planning", Mikael Granberg and Joachim Åström discuss what planners really mean when they display positive attitudes toward increased citizen participation via the use of information and communication technologies, based on a survey about the support

for e-participation in the field of urban planning by the heads of planning departments in Sweden, concluding for the existence of confusing or conflicting attitudes among planners towards participation.

Jens Klessmann, in "Portals as a tool for public participation in urban planning", looks critically how different types of portals and different kinds of participation portals can be used to encourage public participation processes in urban planning.

After that, in Chapter 14, "Can Urban Planning, Participation and ICT co-exist? Developing a Curriculum and an Interactive Virtual Reality Tool for Agia Varvara, Athens, Greece", Alex Deffner and Vassilis Bourdakos examine how information and communication technologies can help in urban participation processes, mainly because it constitutes a relatively simple method of recording the views of both the public and the planners in a variety of subjects.

Bridgette Wessels, in "The Role of Local Agencies in Developing Community Participation in E-government and E-public services", discusses the way in which understanding of participation in e-services has evolved through a social learning process within planning and implementation processes.

In "ICTs and Participation in Developing Cities", Alexandre Repetti and Jean-Claude Bolay provide a review of the use of information and communication technologies for public participation in urban planning, in cities located in developing countries. The authors analyse the challenges and potential of ICT to improve urban planning and public participation, and put forward a number of recommendations for the successful and relevant implementation of ICT in this kind of cities.

In the final chapter of Section Two, "Public participation in e-government: some questions about social inclusion in the Singapore model", Scott Baum and Arun Mahizhnan examine the case of Singapore's E-government model, which, despite being considered to be among the best in the world, has still important weaknesses in what respects public participation.

The Third Section, titled "Innovations and challenges in urban management", with six chapters, explores a number of experiences and innovative practices of urban e-management, in different countries and contexts, as an illustration of the type and extent of the changes going on within the urban planning system.

Antonio Caperna in Chapter 18, "Integrating ICT into sustainable local policies", analyses the role of information and communication technologies in the promotion of sustainable local policies, the opportunities it offers, potential problems, and the relationship with other local policies.

Chapter 19, "Architectures of motility: ICT systems, transport and planning for complex urban spaces", by Darren J. Reed and Andrew Webster, examines the implementation of an intelligent transportation system called BLISS (the Bus Location and Information Sub-System), and shows that urban planners need to engage not only with the technical difficulties of technology implementation in the city, but also with the contingent and experiential processes of those who use it, and are affected by such implementations.

In "RFID in urban planning", Leslie Pang, Vanessa Morgan-Morris, and Angela Howell discuss the application of Radio Frequency Identification (RFID) technology to support the needs and requirements within the realm of urban planning. The authors provide an account of the historic and technical background behind RFID, explore this technology's potential as a practical tool for urban planners and discuss the issues and challenges associated with RFID.

Stephen Aikins, in "E-planning: information security risks and management implications", engages with the security risks and management implications associated with the use of information technology to manage urban and regional planning and development processes, and argues that the emergence of e-planning poses enormous security challenges that need to be managed to ensure integrity, confidentiality and availability of critical planning information for decision-making.

The last two chapters in section three present and discuss the situation of e-Planning in two countries, Turkey and Malaysia. In the penultimate chapter, "E-planning Applications in Turkish Local Governments", Koray Velibeyoglu explores the critical relationship between e-planning applications and their organizational context. The author shows, based on a case study of Turkish municipalities, that the organizational and human aspects of information systems are still the main obstacle in the implementation of information and communication technologies in urban planning. In the final chapter, "GIS implementation in Malaysian statutory development plan system", Muhammad Faris Abdullah, Alias Abdullah and Rustam Khairi Zahari examine the current state of GIS implementation in the Malaysian development plan system comparing it with the state of GIS implementation worldwide.

In sum, the readings in this Handbook of Research on e-Planning provide a well grounded and research focused overview of the emerging e-planning paradigm and will hopefully point readers to future research directions. Ultimately, this collection of essays will ask each reader to reflect on the planning theories that frame the urban planning practice, which methods to use in the preparation and implementation of urban e-plans, how to organise citizen e-participation in urban planning processes, or how to use new information and communication technologies to collect and manage data in different areas of the urban planning process.

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