

## Summary

The present habilitation thesis presents my main scientific academic and professional achievements, following elaboration of doctoral thesis entitled "Interdisciplinary correlations in design, construction and management of residential areas" conducted by Prof. dr. HC eng. Dan Ghiocel and presented in public meeting on May 27 2002 at the Technical University of Civil Engineering of Bucharest.

The main research area continues my the work developed in the Ph.D. thesis, in the interdisciplinary field of urban engineering, with specific focus on housing, transport and mobility in the residential areas and also on its specific climate, including financing sources for components of residential areas.

The main research directions are highlighted below:

- Study of the depreciation process for the residential areas components, including the principles and laws for their wear, dysfunctions' generating factors and parameters for determination of critical time for the wear process. The chapter presents determination of the precarity degree of the residential areas and urban settlements and introduces a specific model for minimizing the subjectivity in analysis for decisions making for rehabilitation / urban renewal.
- Detailing of major dysfunctions on the residential areas components due to major effects of seismic movements on buildings and urban infrastructure. There are extensively discussed the effects of the collapse of a building on the surrounding areas but also several aspects needed for improving the seismic retrofitting process for the residential buildings declared as having a high risk of collapse in case of earthquake occurrence.
- Solutions for financing the rehabilitation of residential zones by well defined entities (owners associations, financial cooperatives), including public private partnership. In addition, a viable scenario for financing the rehabilitation of residential areas components is presented.
- Organizing and conducting public consultations which includes two modules that complement each other: the mechanism of public consultation and participation of civil society as part of the triumvirate between state institutions, business sector, civil society to solve various aspects of social life, including issues related to residential areas.
- Effective methods to reduce traffic congestion in residential areas including the materplan for sustainable transport, adopting various modes of rental cars such as car-sharing, car-pooling, implementation of the travel plan, introduction of green fleet for public transportation, shared spaces etc.
- Urban climate with specific focus on green infrastructure, an issue that was important for a group of researchers that I was part, in the project on Urban Climate Study for Bucharest, financed by Romania –Switzerland program. The first research was to determine, using remote sensing techniques, the distribution of green areas in Bucharest locations in order to verify the uniform distribution and interconnection degree for constitution of green infrastructure. Unlocking the potential of people to participate in preserving and creating green space has enabled the research group to find a solution for this purpose. Studying the possible solutions for information exchange between the citizen and public authority as manager of green infrastructure there was developed a proposal for web-GIS solution to support citizen involvement in decision authority on the monitoring and development of green infrastructure of the city.

The original contribution in the research activity is the approach of the correlations housing and residential areas - mobility – urban climate, elements covered in the articles published in ISI or international databases journals, communications at international conferences and participation in research projects.

In the academic activity the main contribution is embodied in the activity of teaching the disciplines "Theory and practice of urban and regional planning", "Urban traffic engineering ", "Regional Development", "Policies of regional development" and "Local Economic Development" in Technical University of Civil Engineering, Faculty of Civil, Industrial and Agricultural Engineering, Specialization Urban Engineering and Regional Development and the Master Program Urban and Regional Development. They are supported by teaching materials (books, courses, textbooks, lecture notes and guides).

Professional activity included various activities such as participation in several international projects in the field of research, participation in training courses, involvement in professional organizations, participation in the doctoral committees, review of scientific publications, evaluation of research projects and participation in elaboration of urban plans and development strategies of cities.

The plans for development of academic career generally refer to the introduction of an interdisciplinary course on Housing and completing the theoretical part of the courses with case studies and best practices. Scientific career considers many development directions, such as energy and smart cities but also continuing the research on residential areas wear topic. Development of international and national cooperation, as well as taking an active role in research applications and research infrastructure are also important steps.