



**Domain Committee Individuals, Societies,  
Cultures and Health (ISCH)**

**COST Action G9**  
***Modelling Real Property Transactions***  
***2001-2005***

**FINAL EVALUATION REPORT**

Parts 1-8 of this Report is prepared by the Management Committee of the Action. Part 9 is prepared by the Evaluation Panel. The Domain Committee ISCH approved the report on 16 November 2006 and added part 10.

## CONTENTS

1. OVERVIEW: ACTION IDENTIFICATION DATA	3
2. OBJECTIVES	4
3. TECHNICAL DESCRIPTION AND IMPLEMENTATION	4
4. PARTICIPATION AND COORDINATION	5
4.1 Management Committee	5
4.2 Participating Institutions	6
4.3 Meetings of the Management Committee	6
4.4 Meetings of the Working Groups	7
4.5 Short-Term Scientific Missions	7
4.6 Training School	10
5. RESULTS	10
6. DISSEMINATION OF RESULTS	12
6.1 Publications and Reports	12
6.2 Conferences and Workshops	19
6.3 Website	20
6.4 Scientific and Technical Co-operation	20
7. ECONOMIC DIMENSION	23
8. SELF-EVALUATION	23
8.1 Post-action abstract	23
8.2 Findings	24
8.3 Comments to Statements in the Technical Annex	26
9. EVALUATION	28
9.1 Evaluation Panel, Evaluation Procedures and Activities	28
9.2 Results versus Objectives	30
9.3 Outcomes and Achievements	31
9.4 Impact of the Action	32
9.5 European Added-value	32
9.6. Co-ordination and Management	32
9.7 Dissemination of Results	32
9.8 Strengths and Weaknesses	33
9.9 Recommendations	33
10. DC Remarks	35

**Action Identification Data:****COST Action G9****Title: "Modelling Real Property Transactions"****Domain:** Miscellaneous; after Jan 2004 Social Sciences and Humanities**MoU:** 224/01**Entry Into Force:** 1/03/2001**CSO Approval:** 14/12/2000**End of Action or Prolongation:** End 4/06/2005; Prolongation 4/12/2005**1st MC:** 5/06/2001**Total Number of Signatories: 12**

Austria	1/03/2001	Denmark	1/03/2001	Finland	11/04/2001
Germany	1/03/2001	Greece	6/11/2003	Hungary	14/06/2001
Latvia	17/09/2001	Netherlands	1/03/2001	Slovenia	5/04/2001
Spain	1/03/2001	Sweden	3/05/2001	UnitedKingdom	11/04/2001

**Non Cost Institutions participating:**

None

**Working Groups:**

WG1 on Law and Models; WG2 on Cadastral Science; WG3 on Economy

**Action Chair and Science Officer:**

Dr Erik STUBKJÆR Management Committee Chair  
Aalborg University, Department of Development and Planning,  
Fibigerstraede 11, DK-9220 Aalborg, Denmark  
Phone (+45) 9635 8350 Fax (+45) 9815 6541 est@land.aau.dk

Mr Günter SIEGEL, Science Officer 2004-2005

Ms Anna DANTI, Science Officer 2001-2004

**Publications:**

- The Ontology and Modelling of Real Estate Transactions (eds) Heiner Stuckenschmidt, Erik Stubkjær and Christoph Schlieder. Ashgate Publisher's [International Land Management Series](#), 2003. 170 p.
- Standardization in the Cadastral Domain (eds) Peter van Oosterom, Christoph Schlieder, Jaap Zevenbergen, Claudia Hess, Christiaan Lemmen, Elfriede Fendel, Published by The [International Federation of Surveyors](#), 2005 (second edition) Denmark. ISBN-87-90907-36-1
- Real Property Transactions: Procedures, Transaction Costs, and Models (eds) Jaap Zevenbergen, Andrew Frank and Erik Stubkjær (forthcoming) IOS Press, Amsterdam

**Website:** <http://costg9.plan.aau.dk/>**Evaluation Panel:****DC Rapporteur:** Professor Danica FINK HAFNER (SLO)**External Evaluators:** Professor Robert LAURINI (F), Professor Hans SEVATDAL (N)

## **1. OVERVIEW: ACTION IDENTIFICATION DATA (See above)**

## **2. OBJECTIVES**

The main objective of the COST action is to improve the transparency of real property markets and to provide a stronger basis for the reduction of costs of real property transactions by preparing a set of models of real property transactions, which is correct, formalised, and complete according to stated criteria, and then assessing the economic efficiency of these transactions.

The detailed information will be presented in such a way as to include a formal description of the underlying data. For selected European countries a comparative analysis of the economic efficiency of transactions involved in the transfer of property rights will be presented.

The models of real property transactions must satisfy the criteria of validity from an information modelling, ontological perspective, as well as from a legal perspective. The transactions regard inter-organisational business workflows, which are stating or changing property rights and parcel lots.

The essential effects, intended and non-intended, of the real property transactions are likely to differ among the countries being investigated. The comparative analysis of the economic efficiency of transactions will include an identification of these effects and an assessment of their impact on the economic efficiency, including an assessment of the value of transaction information for further purposes.

The main benefit of the action is that governments, professions, and holders of property rights get a better basis for reducing the costs of the transactions of the markets of real estate.

The developed models can be used for drafting new ordinances, and for education. The outcome of the comparative analysis can be used for improving the efficiency of the procedures. The provided description of various effects of property transactions can serve as inspiration for other countries.

## **3. TECHNICAL DESCRIPTION AND IMPLEMENTATION**

The Brussels meeting agreed on the setting up of working groups, as suggested by the Technical Annex. However, the Management Committee found need for a shared development, coordinated at the workshops, which were organised in connection with the MC meetings. Thus, the structure of workshop presentations was made in line with the tasks of the proposed working groups. Presentations may be classified into categories like: broad description of property rights within a country (Latvia), detailed, semi-formal description of property transactions (Denmark, Finland, Hungary, the Netherlands, Slovenia, Sweden), theoretical and methodological issues (property rights; conceptual languages, methods for ontology development), and other, e.g. assessment of transaction costs (Denmark, Finland, Slovenia), XML and graphs (Austria). Further cross-country formalization of descriptions by applying the Unified Modelling Language was hampered until late 2003, mainly due to lack of appropriate software.

The Vienna MC meeting renamed the working groups, and the Delft MC meeting assigned chairmen, with the following result:

WG1 on Law and Models	Chairman:	Christoph Schlieder
WG2 on Cadastral Science	Chairman:	Jaap Zevenbergen
WG3 on Economy	Chairman:	Kauko Viitanen

Science officer, MC Chairman, and the three WG chairmen assessed proposals for four STSMs during 2003, six STSMs during 2004, and five during 2005.

Secretarial services have been performed by Aalborg University as regards the STSMs till the end of 2004, by the hosts of the combined workshop and MC meetings, by hosts of the Working Group meetings, by the Science officer as regards finances and MC meetings, and by the MC Chairman.

Progress has been reported in terms of Progress Reports for 2003 and 2004, and in a different format as of August 22 2002 and October 9 2003.

#### **4. PARTICIPATION AND COORDINATION**

##### **4.1 Management Committee**

Chair:

Dr Erik STUBKJÆR, re-elected 18. Oct. 2003

Deputy Chair:

Dr Andre FRANK, Deputy Chair till 18. Oct. 2003

Dr Jaap ZEVENBERGEN, Deputy Chair as of 18. Oct. 2003

TU Delft, OTB Research Institute for Housing, Urban and Mobility Studies,  
P.O. Box 5030, NL-2600 GA Delft, Netherlands  
Phone +31 15 2784418; Fax +31 15 2782745; j.zevenbergen@otb.tudelft.nl

Current Active Members of the MC:

Dr Apostolos ARVANITIS, Aristotle University of Thessaloniki, Greece

Dr Jānis BALODIS, Riga Technical University, Latvia

Dr Robert William DIXON-GOUGH, University of East London, United Kingdom

Dr Andre FRANK, Universität Wien, Austria

Dr Béla MÁRKUS, University of West Hungary, Hungary

Dr Hans MATTSSON, Royal Institute of Technology, Sweden

Dr Judit NYIRI, University of West Hungary, Hungary

Dr Christoph SCHLIEDER, Bamberg University, Germany

Dr Erik STUBKJÆR, Aalborg University, Denmark

Dr Rados SUMRADA, University of Ljubljana, Slovenia

Dr Peter VAN OOSTEROM, TU Delft, Netherlands

Dr Kauko VIITANEN, Helsinki University of Technology, Finland

Dr Arvo VITIKAINEN, Helsinki University of Technology, Finland

Dr Jaap ZEVENBERGEN, TU Delft, Netherlands

##### **4.2 Participating Institutions**

Austria, Universität Wien

Denmark, Aalborg University

Denmark, Copenhagen Business School

Finland, Helsinki University of Technology  
Finland, National Land Survey  
Germany, Bamberg University  
Greece, Aristotle University of Thessaloniki  
Hungary, University of West Hungary  
Latvia, Riga Technical University  
Netherlands, Delft University of Technology  
Slovenia, University of Ljubljana  
Spain, Universidad Carlos III de Madrid  
Spain, Universidad Pública de Navarra  
Sweden, National Land Survey  
Sweden, Royal Institute of Technology, Stockholm  
United Kingdom, Napier University  
United Kingdom, University of East London

#### **4.3 Meetings of the Management Committee**

8th Workshop and 9th and final MC meeting  
October 13.-15. 2005 in Stockholm, Sweden

7th Workshop and 8th MC meeting  
June 9.-11. 2005 in Thessaloniki, Greece

6th Workshop and 7th MC meeting  
October 14.-16. 2004 in Riga, Latvia

5th Workshop and 6th MC meeting  
May 13.-15. 2004 in Helsinki, Finland

4th Workshop and 5th MC meeting  
October 16. - 18. 2003, Sopron, Hungary

3rd Workshop and 4th MC meeting  
October 10. - 12. 2002, Delft, the Netherlands

2nd Workshop and 3rd MC meeting  
April 11. - 13. 2002, Wien-Schwechat, Austria

1st Workshop and 2nd MC meeting  
Nov 1. - 3. 2001, University of Bremen, Germany

1st MC meeting  
June 5. 2001, Brussels

#### **4.4 Meetings of the Working Groups**

WG 2 Cadastral Science meeting  
August 25.-26. 2005 in Aalborg, Denmark

WG 3 Economy meeting  
March 16.-19. 2005 in Grange-over-Sands, United Kingdom

*Standardization in the Cadastral Domain.*  
*A Joint Conference, organized by COST G9, WG1 and 2, and FIG Commission 7*  
December 9.-10. in Bamberg, Germany

WG 2 Cadastral Science meeting  
September 2.-3. 2004 in Szekesfehervar, Hungary

WG 3 Economy meeting  
March 11.- 13. 2004 in Ljubljana, Slovenia

#### **4.5 Short-Term Scientific Missions**

Young scientists performed five (2005), six (2004), and four (2003) Short Time Scientific Missions (STSMs).

##### STSMs during 2005, starting with last performed:

Researcher: Jesper Paasch, Sweden  
Host institution: Delft University of Technology, The Netherlands  
Time period: 2.-7. October 2005  
Topic: The Dutch system of rights and restrictions in land will be analysed on the basis of a theoretical model of real property. This model was presented by the researcher at the COST G9 workshop in Bamberg 2004. The result will be part of a case study analysing European real property rights and restrictions.

Researcher: Maarten Ottens, the Netherlands  
Host institution: Aalborg University, Denmark  
Time period: 22.-27. May 2005  
Topic: Complex tasks, like the constructing and operating of a large airport, has motivated research on conceptualisation and analysis of this type of socio-technical systems. In order to get more insight, this approach is used to analyse cadastral systems. The management and development of cadastral systems compare to the complexity of the airport example, but as the physical and technical aspects are relatively simple, the analysis can focus on the social aspects. A contribution to the final publication is in progress.

Researcher: Maarten Ottens, the Netherlands  
Host institution: The Royal Institute of Technology in Stockholm, Sweden  
Time period: 11.-19. May 2005  
Topic: Aiming at improving the transparency of real property markets within the European Union, the visit aims at developing an analytical argument for what a model aiming at reaching this objective should contain. Both static and dynamic system models are to be developed, because one of them cannot give enough information to reach the stated objective. The static model should answer the questions 1) 'What rights do I have?' and 2) 'What is my land? The Dynamic model should deal with the question 3) 'What is transferred?' and answer the question 4) 'How can I transfer?' The model provides a framework for relating these different questions and can be used to point out omissions in current models.

Researcher: Claudia Hess, Germany  
Host institution: The Royal Institute of Technology in Stockholm, Sweden  
Time period: 3.- 8. April 2005

Topic: An ontology-based methodology was adapted to the previously prepared process models of property transfer and subdivision. The methodology was evaluated with process models for Denmark and for England / Wales. The formal comparison of process models, as it was made during the STSM, provides a better understanding of national processes, as the ontology-based methodology permits a detailed and consistent analysis of similarities and differences between process models. The approach can be used to enhance the transparency of real property markets when applied to the comparison of a large number of national process models, because all models are compared in the same formal way and on the same level of detail.

Researcher: Tina Koukopoulou, Greece

Host institution: The Royal Institute of Technology in Stockholm, Sweden

Time period: 10.-14. Jan 2005

Topic: Property Transactions were compared between Sweden and Greece. Firstly, the Swedish and the Greek Property Registration Systems were described and compared. Next, in order to understand how the Swedish and the Greek Property Registration System work, the sale of a land parcel and the subdivision of a land parcel were examined. For each transaction and for both countries, activity diagrams and use case diagrams were designed in UML, aiming in the comparison along with the identification of the commonalities and the differences of the procedures that take place, as well as the actors involved in the procedure.

#### STSMs during 2004

Researcher: Ilkka Mikkonen, Finland

Host institution: University of Ljubljana, Slovenia

Time period: 20.-28. November 2004

Topic: To investigate the real property transaction costs in Slovenia, and how these costs arise and differ between Slovenia and Finland. The study includes an analysis of the involved institutions and authorities in the process of the real property transfer.

Researcher: Marina Vaskovich, Sweden

Host institution: University of Ljubljana, Slovenia

Time period: 22.-28 August 2004

Topic: A comparative analysis of property transaction models for Denmark, England / Wales, and Slovenia. In particular the mission aimed at systematising specific cadastral/legal knowledge gained during two implemented Short Term Scientific Missions in Denmark (March 2003) and United Kingdom (April 2004) within the G9 framework, and identifying commonalities/differences for each country.

Researcher: Claudia Hess, Germany,

Host institution: Delft University of Technology, The Netherlands

Time period: 9.-13. August 2004

Topic: Studying the modelling of the core cadastral model with Semantic Web technologies, and above all ontologies. The structure of the modelling process and the relations between core and national models will be focus of attention. Evaluation of the ontology-based verification of the core model conformity was discussed with domain experts. Outcome presented at Bamberg conference 2004.

Researcher: Anka Lisec, Slovenia

Host institution: Helsinki University of Technology, Finland

Time period: 14.-21. June 2004

Topic: Studying and comparing the Finnish and Slovenian real property transactions, including visiting field operations as well as case work at the Finnish National Land

Survey. Comparable descriptions of the transactions were prepared through further discussions with university staff, and thus a model to be applied for subsequent cost estimates was prepared.

Researcher: Marina Vaskovich, Sweden

Host institution: University of East London, United Kingdom

Time period: April 26 – May 2 2004

Topic: Studying property transfer and parcelling out procedures for England and Wales by applying the methodology developed within the G9 framework. Moreover developing complete and formalized descriptions of these property transactions, and revising the descriptions through discussions with university staff and practising chartered surveyor.

Researcher: Armands Auzins, Latvia

Host institution: The Royal Institute of Technology in Stockholm, Sweden

Time period: 19.-23. January 2004

Topic: To investigate institutional framework (organisational structures and regulations) in Sweden, including its relation to transactions and influences on real land use, using previously examined methodology of COST action G9 for provision of valid information, as well as to compare the Swedish and the Latvian situation.

### STSMs during 2003

Researcher: Jaap Zevenbergen, the Netherlands

Host institution: Helsinki University of Technology

Time period: 3-7 November 2003

Topic: Further test of methodology on describing real property transactions. Foreign and national experts discussed fairly detailed descriptions, and identified aspects that were not clearly rendered by the chosen formalism, leading to suggestions for improvement.

Researcher: Jantien Stoter, the Netherlands

Host institution: Aalborg University, Denmark

Time period: 3-28 November 2003

Topic: Focus on 3D aspects: multi-storey houses and sub-soil constructions. Comparative modelling of Danish and Dutch national information systems on real property, analyses of specific Danish cases, and assessment of availability of information for needs in the land market.

Researcher: Miran Ferlan, Slovenia

Host institution: Royal Institute of Technology, Stockholm

Time period: 14-20 April 2003

Topic: Remodelling of basic real property transactions (conveyance, subdivision) of Slovenia. Principles of mortgage and pre-emption rights were described and compared for Slovenia, the Netherlands, and Sweden, especially as regards pre-emption rights of municipalities. Different roles of geodetic surveyor were identified and discussed.

Researcher: Marina Vaskovich, Sweden

Host institution: Aalborg University, Denmark

Time period: 16-22 March 2003

Topic: To test methodology on describing real property transactions outlined in Technical Annex. Draft descriptions were scrutinized by foreign expert and extended to satisfy criteria of explanatory detail. Through interviews with practising Danish

surveyors, the conformity of the formalised description relative to actual Danish practise was assessed.

#### **4.6 Training school**

Within the framework of The International Doctoral School of Technology and Science of Aalborg University, the training school/ PhD course: Cadastral Development – The Contribution of Scientific Enquiry, was performed 2.-6. May 2005.

The objective of the training school was to bring together (young) PhD-students and mid-career experts with a scientific inclination to learn about and develop research skills regarding cadastral issues. The school thus contributes to sustaining the efforts of the G9 action, and especially Working Group 2 (Cadastral Science). The first version of the training school in May 2003 among others led Greece to join the action. Both the 2003 and the 2005 version profited also from mobility grants from Nordic Academy for Advanced Study, NorFA, now NordForsk, Nordic Research Board.

Of the 11 participants of the 2005 course, four came from Nordic university departments, all participating in the G9 action. From further EU countries came four, of which one from a participating university, and from Ukraine and Russia came three, of which two were studying at an action university. Of the six lecturers, four were active in the action, including MC Chair, Deputy Chair, and a WG-Chair.

### **5. RESULTS**

The Technical Annex refers to economic theory in brief and general terms (e.g. p. 9-10), while legal-administrative aspects, and ontologies for geographic information processing are more richly treated. The outcome of the research, coordinated through this action, is both a more adequate application of economic theory to the regime of immobile property, as well as an emerging modelling of the, from a scientific point of view, largely 'subconscious' activities within this regime. The chosen approach focused on behaviour, rather than the legal vocabulary, and appeared feasible.

Compared to the world at large, the European countries have institutions that allow for complex exchanges, e.g. regarding rights in immobile property. The state plays a dominant role in providing stable and skilful third parties that drastically reduces individual enforcement costs and thus allows for impersonal exchanges. However, opportunism and cheating are present as everywhere and the complexity of the modern society increases the return of such behaviour. However, the formal rules of law, public agencies, and eventually coercive power supplements informal constraints of behaviour, thereby reducing the tendency to opportunistic behaviour.

As regards the costs of conveyance, the object to be exchanged appears for the eye as a piece of the surface of the Earth, with buildings and other fixtures, but essentially what is exchanged is a set or a bundle of rights over such physical object. The measurement costs thus include measurement of the physical as well as the legal attributes of the unit. Some of these may be straightforward to establish, e.g. size and general features. Others, like maintenance costs and characteristics of neighbours, may be more difficult to ascertain. As regards the legal attributes, measurement costs arise not mainly due to the rights explicitly stated in the deed, but rather from uncertainties whether all liabilities are taken into account, whether the seller is entitled to dispose of the property, and whether restrictions in terms of pre-

emption rights, expropriation or spatial planning measures reduce owner rights now or in the future.

The institutional arrangement of transactions in real property need not be optimal, that is: minimize transaction costs. Rather it should be expected that the mixture of legal rules, agency objectives and practices, professional codes of conduct and actual behaviour, degree of honesty in information exchange among parties, etc, sometimes reduces and sometimes raises transaction costs. The purpose of the modelling effort of the COST G9 action is precisely to uncover components or configurations that make the costs differ.

The research performed in the context of G9 has charted in considerable detail the procedures related to conveyance and change of property shape through subdivision, etc. (A discussion of the terms transaction vs. procedure vs. process is deferred here). Through this, various ways of installing the knowledgeable and impartial third party that overlooks transactions have been identified. Interestingly, it appears that tasks performed by notaries in central and southern parts of Europe seem to be taken care of by surveyors in Northern Europe.

The assessment of transaction costs was addressed during 2004, namely through two presentations based on Danish evidence, and one on Slovenian evidence. Two STSMs further developed on Finnish-Slovenian cost comparisons. The transaction costs are estimated both from the point of view of agents, as also in terms of tentative national accounts of the real estate segment of society (Satellite Accounts in the terminology of the Systems of National Accounts). The applied approach seems promising, and reviewed papers are in print.

Finally, work on developing and comparing core ontologies of the domain was substantially investigated through the widely recognized conference in Bamberg, December 2004, and through STSMs to the Netherlands and Sweden.

Besides reviewed papers, the scientific outcome of the action is consolidated in two books, one emerging from the kick-off meeting in Bremen, 2001, and one in preparation, details being provided in section 6.1.

Perhaps as important as the specific research outcomes, the present COST action has consolidated scattered research efforts. University education of geodetic surveyors includes a remarkable amount of legal-administrative issues, but at the technical universities where education mostly is offered, it is difficult to establish a research group of a sufficient size. The COST scheme has made such 'invisible faculty' emerge through workshops, Management Committee meetings, and through Short Term Scientific Missions, where young staff have addressed an aspect of the G9 research domain in dialogue with senior staff at the hosting institutions.

The research approach of G9 inspired Master and PhD work at a handful of university departments. Furthermore, the body of papers produced during the action provides a reference frame for further research, which did not exist before the G9 action. Another aspect of this consolidation of a research domain is the performance in May 2003 and May 2005 of a one-week Training school/PhD course: Cadastral Development - The Contribution of Scientific Enquiry, as well as a recent proposal of instituting a one-semester diploma module within a master level programme of Aalborg University, Denmark. The module will address the real estate transactions, as analysed through the G9 action: the processes and the professional and public actors, etc. as well as the involved institutions and their change. To better understand the change processes, cultural studies and guidelines by the Commission and other donors are included, cf. the Commission communication COM(2004) 686 final.

Putting the above mentioned research in perspective, it should be noted that the G9 action was drafted late in 1999. Since then, Hernando de Soto issued his much quoted book on the importance of formalization of real property rights world-wide. This event matched a changed focus by among others the World Bank from reducing state volume towards strengthening primary state functions, including the property rights regime. The World Bank by 2004 included the ease of property registering among its 'Doing business'-indicators, showing notable differences also within the EU. Furthermore, the fact that the Ninth EU Competition Law and Policy Workshop, Florence, 11-12 June 2004, addressed the role of liberal professions and of conveyance, while the European University Institute frames the project: 'Real Property Law and Procedure in the European Union' all points to the relevance of the focus of the present action.

On this background, the G9 research partners seem to hold an important potential for further analyses and implementation support, as it relates the abstract notions of institution and transaction costs to European evidence in the field of real estate. The progress and outcome are indeed very satisfactory, taking the available resources into account.

## **6. DISSEMINATION OF RESULTS**

### **6.1 Publications and Reports**

Contributions under review towards a book, which summarizes research outcome and will be published by the IOS Press, Amsterdam, are presented at the outset. Subsequently follows content of the proceedings of the Bamberg conference. Those marked with \* have been selected and reviewed for publication in the fifth cadastral special issue of Computers, Environment and Urban Systems (CEUS). Next follows the content of a report, which is the outcome of a collaboration of G9-related researchers with the National Land Surveys of the Nordic countries. The kick-off workshop in Bremen, November 2001, triggered contributions, which were published in a book in the Ashgate International Land Management Series. Also, this content is detailed below.

After the four mentioned titles, the titles of articles and reports are presented in reverse chronological order. Except for national reports from Greece and Hungary, presentations at COST G9 workshops are included here only as far as they are published elsewhere, or are in the process of being published.

---

**Real Property Transactions: Procedures, Transaction Costs and Models (eds) Jaap Zevenbergen, Andrew Frank, Erik Stubkjær** [Contributions under review as of mid-December 2005]

#### Part 1 – Overview of action and contents

- Modelling Real Property Transactions – Stubkjær, Frank and Zevenbergen
- Guide for readers

#### Part 2 - Procedures

- Property transaction modelling – Ferlan, Sumrada and Mattsson
- Towards more efficient transaction procedures in Latvia - Auzins

#### Part 3 – Transaction Costs

- Towards National Accounts of Transactions in Real Estate: the Case of Denmark and Slovenia – Stubkjær, Lavrac, Gysting

- Real Property Transaction Costs in Finland - Vitikainen
- Real Property Transaction Costs in Slovenia - Ceh

#### Part 4 – Modelling approaches

- Exploring the social aspects of socio-technical systems: A socio-technical analysis of cadastral systems – Ottens, Stubkjær
- Approaches for standardization of legal issues – Paasch
- Modelling the Spatial Cadastral Data; the Greek Case – Arvanitis, Sismanidis
- Ontology Engineering for the Comparison of Cadastral Processes – Hess, Vaskovich
- Ontology-based Development of Reference Processes – Schlieder, Hess
- Hierarchies in dividing processes – Navratil, Frank

#### Part 5 – Expanding the Scope

- Institutional and Information Model of Hungarian Land Consolidation – Nyiri, Kottyan
  - Pre-emption models – Ferlan, Zevenbergen, Mattsson, Sumrada
  - ?- Land consolidation Procedures - Thomas
- 

**Standardization in the Cadastral Domain (Eds) Peter van Oosterom, Christoph Schlieder, Jaap Zevenbergen, Claudia Hess, Christiaan Lemmen, Elfriede Fendel;** Published by The International Federation of Surveyors, 2005 (second edition) Lindevangs Alle 4, DK-2000 Frederiksberg Denmark ISBN-87-90907-36-1 (Contributions marked with \* will appear in CEUS 5<sup>th</sup> cadastral special issue)

Preface Peter van Oosterom, the Netherlands ..... ix

#### SEMANTICS, ONTOLOGY AND KNOWLEDGE ENGINEERING

Keynote Address: Comparing European Cadastres - Methodological Questions <i>Andrew Frank, Austria</i> .....	1
*Ontology-based Verification of Core Model Conformity in Conceptual Modeling <i>Claudia Hess, Christoph Schlieder, Germany</i> .....	15
The Cadastral System as a Socio-Technical System <i>Maarten Ottens, the Netherlands</i> .....	31
*From Models to Data: a Prototype Query Translator for the Cadastral Domain <i>Claudia Hess, Germany, Marian de Vries, the Netherlands</i> .....	43

#### GEO-ICT INDUSTRY

Cadastre 2014 – From Vision to GIS <i>Carsten Bjornsson, USA</i> .....	57
Extensible Models and Templates for Sustainable Land Information Management – Intent and Purpose <i>Pierre le Roux, France</i> .....	71
Observation on the Proposed Standardized Cadastral Domain Model – Where Do We Go From Here? <i>Louis Hecht, USA</i> .....	85
*Profile Definition for a Standardized Cadastral Model <i>Hugh Asthe, Greg Mulholland, Rick Nyarady, Canada</i> .....	99

#### LEGAL AND ADMINISTRATIVE ISSUES

Direction in Modeling Land Registration and Cadastre Domain – Aspects of EULIS Glossary Approach, Semantics and Information Services <i>Esa Tiainen, Finland</i> .....	117
Expanding the Legal/Administrative Package of the Cadastral Domain Model – From Grey to Yellow <i>Jaap Zevenbergen, the Netherlands</i> .....	139
A Legal Cadastral Domain Model <i>Jesper Mayntz Paasch, Sweden</i> .....	145
*Developing Cadastres to Service Complex Property Markets <i>Jude Wallace, Ian Williamson, Australia</i> .....	149
<u>MODEL</u>	
Assessment of the Core Cadastral Domain Model from a Cadastre 2014 Point of View <i>Jürg Kaufmann, Christian Kaul, Switzerland</i> .....	165
Remarks and Observations Related to the Further Development of the Core Cadastral Domain Model <i>Peter van Oosterom, Christiaan Lemmen and Paul van der Molen, the Netherlands</i> .....	175
Cadastral Modeling – Grasping the Objectives <i>Erik Stubkjær, Denmark</i> .....	193
Moving Focus from Organisation to Information <i>Tommy Ljunggren, Sweden</i> .....	207
<u>TESTING IN DIFFERENT COUNTRIES</u>	
*Swiss Cadastral Core Data Model – Experiences of the Last 15 Years <i>Daniel Steudler, Switzerland</i> .....	217
*A Modular Standard for the Cadastral Domain: Application to the Portuguese Cadastre <i>João Paulo Hespanha, Portugal, Peter van Oosterom, the Netherlands, Jaap Zevenbergen, the Netherlands, Gonçalo Paiva Dias, Portugal</i> .....	231
Standards and New IT Developments in Hungarian Cadastre <i>Gyula Iván, Szabolcs Mihály, Gábor Szabó, Zoltán Weninger, Hungary</i> .....	257
Modelling of Land Privatisation Process in Belarus <i>Marina Vaskovich, Belarus</i> .....	273
<u>REFERENCE PAPER</u>	
A modular standard for the Cadastral Domain <i>Christiaan Lemmen, Paul van der Molen, Peter van Oosterom, Hendrik Ploeger, Wilko Quak, Jantien Stoter and Jaap Zevenbergen</i> .....	293

---

**Julstad, Barbro (Ed) Fastighetsbegreppen i de nordiska länderna (The concept of real property rights in the Nordic countries).** LMV-rapport 2003:3 Lantmäteriet, Gävle. ISSN-nr: 280-5731. 116p.

Julstad, Barbro (2003) Fastighetsbegreppen i de nordiska länderna (The concept of real property rights in the Nordic countries), pp. 9 – 13

Sevatdal, H (2003) Eiendomsbegrepet i Norge (The concept of real property in Norway), pp. 14 - 34

Stubkjær, E (2003) Ejendomsret til fast ejendom i Danmark (Real property rights in Denmark), pp. 35 – 65

Viitanen K, Arvo Kokkonen, Arvo Vitikainen (2003) Fastighetsbegrepp i Finland (The concept of real property in Norway), pp. 66 – 82

Julstad, B (2003) Fastighetsbegreppet i Sverige (The concept of real property in Sweden), pp. 83 - 115

---

**The Ontology and Modelling of Real Estate Transactions (eds) Heiner Stuckenschmidt, Erik Stubkjær and Christoph Schlieder.** Ashgate Publisher's International Land Management Series. 2003. 170 p.

Part I: Cadastre, Law and Economics

1. Erik Stubkjær: Modelling real property transactions
2. Hans Mattsson: Aspects of real property rights and their alteration
3. Leo Zaibert and Barry Smith: Real estate - Foundations of the ontology of property

Part II: Requirements and National Perspectives

4. Kauko Viitanen: Purchase of real property in Finland
5. Robert Dixon-Gough and Mark Deakin: Property transactions in the UK - A situation of institutional stability or technical change?
6. Armands Auzins: Land tenure and real property transaction types in Latvia

Part III: Ontological Modelling

7. Ubbo Visser and Christoph Schlieder: Modelling real estate transactions - The potential role of ontologies
8. York Sure: A tool-supported methodology for ontology-based knowledge management
9. Chris Partridge and Milena Stefanova: Building a foundation for ontologies of organizations

Part IV: Systems Engineering

10. Rados Sumrada: Conceptual modelling of cadastral information system structures
11. Harry Uitermark: Ontology construction for geographic data set integration

Glossary

Index.

---

### Publications 2005

Arvanitis, A and A. Sismanidis (2005) - "The Greek National Report within the framework of COST Action G9", COST Action G9 – Modelling Real Property Transaction - 7th Workshop and 8th MC meeting, 9th – 11th June 2005 in Thessaloniki, Greece.

[http://www.topo.auth.gr/Cost/PDF/A\\_Sismanidis-Report\\_The%20Greek%20National%20Report%20within%20the%20framework%20of%20COST%20Action%20G9.pdf](http://www.topo.auth.gr/Cost/PDF/A_Sismanidis-Report_The%20Greek%20National%20Report%20within%20the%20framework%20of%20COST%20Action%20G9.pdf) (1.5 MB)

Gysting, C (2005) The Treatment of Cost of Ownership Transfer in the Danish National Accounts. *Nordic Journal of Surveying and Real Estate Research* 2(1) 37-48

Lavrac, I (2005) Towards National Real Estate Accounts - The Case of Slovenia. *Nordic Journal of Surveying and Real Estate Research* 2(1) 49-56

Nyiri, Judit Mizseiné (2005) Beszámoló a COST G9 projekt kutatási munkájáról, (Report of the research activity COST G9) *Geodézia és Kartográfia*, Vol. LVII. 2005/9, pp. 41-43

Paash, J. M. (2005) Legal Cadastral Domain Model – An Object-oriented Approach *Nordic Journal of Surveying and Real Estate Research* 2(1) 117-136. The Finnish Society of Surveying Sciences, Helsinki, Finland

Šumrada, Radoš (2005) Property Transactions in Slovenia: UML in Use Case Modelling *GIM International* 19 (10) 12-15.

Stubkjær, E (2005) Satellite Accounting of Housing and Real Estate Affairs – The Case of Denmark. *Nordic Journal of Surveying and Real Estate Research* 2(1) 11-36

Vaskovich, M. (2005). Purchase of Real Property in Belarus: Modelling and Evaluation. . Proceedings [Online] of the FIG Working Week 2005 and GSDI-8 "From Pharaohs to Geoinformatics". Cairo, Egypt. TS30.1  
[http://www.fig.net/pub/cairo/papers/ts\\_30/ts30\\_01\\_vaskovich.pdf](http://www.fig.net/pub/cairo/papers/ts_30/ts30_01_vaskovich.pdf)

Vaskovich, M., Dixon-Gough, R.W., Stubkjær, E. (forthcoming). Comparative evaluation of purchase and subdivision processes in Denmark, England and Wales, and Belarus. International Land Management Series. UK: Ashgate.

Zevenbergen, J., Stubkjær, E. (2005) Real Property Transactions: Challenges of Modeling and Comparing. Proceedings [Online] of the FIG Working Week 2005 and GSDI-8 "From Pharaohs to Geoinformatics". Cairo, Egypt. TS11.4  
[http://www.fig.net/pub/cairo/papers/ts\\_11/ts11\\_04\\_zevenbergen\\_stubkjaer.pdf](http://www.fig.net/pub/cairo/papers/ts_11/ts11_04_zevenbergen_stubkjaer.pdf)

#### Publications 2004

Arvanitis, A and E.Hamilou (2004) Modelling Cadastral Transactions in Greece Using UML, FIG Working Week 2004, Athens, Greece.  
[http://www.fig.net/pub/athens/papers/ts13/TS13\\_4\\_Arvanitis\\_Hamilou.pdf](http://www.fig.net/pub/athens/papers/ts13/TS13_4_Arvanitis_Hamilou.pdf)  
[http://www.fig.net/pub/athens/papers/pdf/ts\\_13\\_4\\_arvanitis\\_hamilou\\_ppt.pdf](http://www.fig.net/pub/athens/papers/pdf/ts_13_4_arvanitis_hamilou_ppt.pdf)

Auzins, A. (2004) Institutional Aspects of Real Property Formation: The Case of Latvia. Economic Science for Rural Development, Proceedings of the International Scientific Conference. Regional Development, Nr.6, p.41-46, Jelgava.

Auzins, A. (2004) Institutional Arrangements: A Gate Towards Sustainable Land Use. *Nordic Journal of Surveying and Real Estate Research* Vol. 1, 2004, p.61-65, Finnish Society of Surveying Sciences

Markus, Bela and Judit Nyiri (2004) Organisational structures and their role in the processes of the real property transactions (Hungarian National Report). College of Geoinformatics. University of West Hungary

Mattsson, H. (2004) Property rights and registration in a perspective of change. In *The 225 year anniversary publication*. Moscow: MIIGAiK university

Navratil, G., & Frank, A.U. 2004. 'Processes in a Cadastre' *Computers, Environment and Urban Systems* 28 (5), pp: 471-486.

Vaskovich, M. (2004). Modelling of Land Privatisation Process in Belarus. *The joint COST Action G9 and the FIG Commission 7 Workshop on Standardization in the*

*Cadastral Domain*, Bamberg, Germany, December 9-10, 2004. [Online]. Available: <http://www.oicrf.org/> [accessed 19th of August 2005]

### Publications 2003

Auzins, Armand (2003) Institutional arrangements - A gate towards sustainable land use. Paper, presented at Workshop on 'The Commons in Transition: property on natural resources in CEEC', Prague, April 11-13, 2003, available at [http://dlc.dlib.indiana.edu/documents/dir0/00/00/10/57/dlc-00001057-00/CT\\_Auzins.pdf](http://dlc.dlib.indiana.edu/documents/dir0/00/00/10/57/dlc-00001057-00/CT_Auzins.pdf)

Auzins, A. (2003) Terminology Resources in Land Management: development need and possibilities. Proceedings of the International Scientific - Methodical Conference 'Baltic Surveying'03, Tartu. (unpublished)

Frank, Andrew (2003) A Case for Simple Laws. Paper, presented at a multi-disciplinary workshop, The Mystery of Capital and the Construction of Social Reality with Hernando de Soto, Institute for Liberty and Democracy, Lima, Peru, and John Searle, University of California, Berkeley, hosted by the University at Buffalo, Buffalo New York, April 12 to 15, 2003  
<http://ontology.buffalo.edu/03/moccsr/Frank.pdf>

Lemmen, CHJ & Oosterom, PJM van (2003) Easy flow of cadastral information between organisations, towards a core cadastral domain model. *GIM International*, 17(5), pp. 12-15.

Lemmens, MJPM & Lemmen, CHJ (2003) Standardisation of the cadastral domain: lands, rights, persons. *GIM International*, 17(4), pp. 40-47.

Lemmen, CHJ, Molen, P van der, Oosterom, PJM van, Ploeger, HD, Quak, CW, Stoter, JE & Zevenbergen, JA (2003) A modular standard for the cadastral domain. In: Konecny, M, Friedmannova, L, Kolar, M & Stepankova, P (Ed.), Proceedings of the 3rd international symposium on digital earth: information resources for global sustainability. (pp. 399-419). Brno: International Society on Digital Earth.

Lemmen, CHJ & Oosterom, PJM van (2003). Further progress in the development of a core cadastral model. In -- (Ed.), Still on the frontline: Proceedings of the FIG working week and the 125th anniversary of FIG. (pp. 1/13-13/13). Frederiksberg: FIG Office.

Mattsson H. (2003). An interview about the European research including the COST Action G9. In *Gränssnittet* – the magazine of the National Land Survey of Sweden (in Swedish), No.3.

Navratil, Gerhard and Andrew U. Frank (2003) Modeling Processes Defined by Laws. Paper presented at the 6th AGILE Conference on Geographic Information Science, Lyon, France 2003.

Oosterom, PJM van, Gris , S. & Lemmen, CHJ (2003). Development of a cadastral domain model. In -- (Ed.), Proceedings of the 2nd cadastral congress. (pp. 213-233). Frederiksberg: FIG Office.

Oosterom, PJM van & Lemmen, CHJ (2003) Towards a standard for the cadastral domain. *Journal of geospatial engineering*, 5(1), pp. 11-27.

Stoter, Jantien (2003) 3D aspects of property transactions: Comparison of registration of 3D properties in the Netherlands and Denmark, report on the short-term mission in the COST framework at Aalborg University, November, 2003. Delft: Section GIS technology, GIS Report No 24, TU Delft, 22 p.

Stubkjær, Erik (2003) The Institutionalization of Real Property Rights: The Case of Denmark. Paper, presented at a multi-disciplinary workshop, The Mystery of Capital and the Construction of Social Reality, with Hernando de Soto, Institute for Liberty and Democracy, Lima, Peru, and John Searle, University of California, Berkeley, hosted by the University at Buffalo, Buffalo New York, April 12 to 15, 2003  
<http://ontology.buffalo.edu/03/moccsr/Stubkjaer.pdf>

Stubkjær, E. (2003) Modelling units of real property rights, pp. 227 - 238 in K. Virrantaus, H. Tveite (Eds) ScanGIS'03 Proceedings, 9th Scandinavian Research Conference on Geographical Information Sciences, June 2003. Espoo, Finland. ISBN 951-22-6565-6. 296 p.

Stubkjær, Erik (2003) Research Contributions towards Guidelines for Land Administration. Paper, presented at UN-WPLA/FIG Com3, Com7 joint workshop: "Spatial Information Management for Sustainable Real Estate Market - Best Practice Guidelines on Nation-wide Land Administration", Athens, 28-31 May 2003. 14 p. [www.survey.ntua.gr/main/labs/photo/research/wg\\_33/wpla/papers/TS2.3.Erik%20Stubkjaer.doc](http://www.survey.ntua.gr/main/labs/photo/research/wg_33/wpla/papers/TS2.3.Erik%20Stubkjaer.doc);

Stubkjær, E. (2003) Comments on the Core Cadastral Domain Model (v2) – A Danish view. Paper prepared for Workshop on 'Cadastral Data Modelling', Enschede, the Netherlands, March 17-18, 2003.

Zevenbergen, Jaap (2003) The Dutch system of land registration -Title registration with a 'privatized' registrar. Paper, presented at EULIS Seminar on Conveyancing Practices, 15-16 May 2003, Lund, Sweden.  
[http://www.eulis.org/pdf/Annex\\_3\\_Jaap\\_Zevenbergen.pdf](http://www.eulis.org/pdf/Annex_3_Jaap_Zevenbergen.pdf) (15 p.)

Zevenbergen, Jaap (2003) Registration of Property Rights; a Systems Approach - Similar tasks, but different roles *Notarius International* 8 (1-2) 125-137 The Journal of UINL, Union Internationale du Notariat Latin. ISSN: 1385 - 1209

### Publications 2002

Bittner, S and Andrew U. Frank: A formal model of correctness in a cadastre, *Computers, Environment and Urban Systems*, 26 (5) September 2002, pp. 465-482

Stubkjær, E. (2002) Modelling Real Property Transactions. Proceedings [online] FIG XXII International Congress, Washington, D.C. USA, April 19-26 2002,  
[http://www.fig.net/figtree/pub/fig\\_2002/Js14/JS14\\_stubkjaer.pdf](http://www.fig.net/figtree/pub/fig_2002/Js14/JS14_stubkjaer.pdf)

Šumrada, Rados (2002) Legal Issues Regarding Spatial Data. Proceedings [online] FIG XXII International Congress, Washington, D.C. USA, April 19-26 2002 TS3.2  
[http://www.fig.net/figtree/pub/fig\\_2002/Ts3-2/TS3\\_2\\_sumrada.pdf](http://www.fig.net/figtree/pub/fig_2002/Ts3-2/TS3_2_sumrada.pdf)

Šumrada, R. (2002) Modeling methodology for cadastral subdivision process. Proceedings [online] GIS 2002 International Symposium, organised by the Chamber

of Surveying Engineers Turkey, FIG and Istanbul Technical University, Istanbul, 23-26 September 2002 [http://www.fig.net/com\\_3\\_istanbul/PDF/R.Sumrada.pdf](http://www.fig.net/com_3_istanbul/PDF/R.Sumrada.pdf)

Zevenbergen, J (2002) A Systems Approach to Land Registration and Cadastre, Proceedings [online] FIG XXII International Congress, Washington, D.C. USA, April 19-26 2002 TS7.2 [http://www.fig.net/pub/fig\\_2002/TS7-2/TS7\\_2\\_zevenbergen.pdf](http://www.fig.net/pub/fig_2002/TS7-2/TS7_2_zevenbergen.pdf)

### Publications 2001

Stubkjær, Erik (2001) Integrating ontologies: Assessing the use of the Cyc ontology for cadastral applications. Pp 171 -184 in Bjørke, Jan Terje; Tveite, Håvard (Eds) ScanGIS'2001 Proceedings of the 8th Scandinavian Research Conference on Geographical Information Science, 25th-27th June 2001, Ås, Norway. Published by the Department of Mapping Sciences, Agricultural University of Norway, Postboks 5034, N-1432 Ås, Norway and Norwegian Defense Research Establishment, Norway. 275 p. ISBN 82-576-9502-5.

Frank, A.U. (2001) Tiers of ontology and consistency constraints in geographic information systems, *International Journal of Geographical Information Science*, 15 (7), pp: 667-678.

H. Stuckenschmidt, E. Stubkjær & Ch. Schlieder (2001) Modeling Land Transactions: Legal Ontologies in Context Second International Workshop on Legal Ontologies, 13 December 2001, University of Amsterdam, Netherlands

### Publications 2000

Stubkjær, Erik (2000) Real estate and the ontology of multidisciplinary, e.g. cadastral, studies, in: Stephan Winter (Ed): Geographical Domain and Geographical Information Systems. Geoinfo Series, vol 19, pp 97- 109. Institute for Geoinformation, Vienna University of Technology. ISBN 3-901716-20-3.

Stubkjær, Erik (2000) Information communities - A case study in the ontology of real estate, in: Berit Brogaard (Ed): Rationality and Irrationality, Papers of the 23rd International Wittgenstein Symposium, August 13-19 2000, Kirchberg am Wechsel, Austria. Contributions of the Austrian Ludwig Wittgenstein Society, Vol 8 (2), pp159-166. ISSN 1022-3398.

Stubkjær, Erik and Stuckenschmidt, Heiner (2000) Ontological engineering for the cadastral domain. in Fendel, EM (ed.): Proceedings of UDMS 2000. 22nd Urban and Regional Data Management Symposium, Delft, the Netherlands, 11-15. September 2000.

## **6.2 Conferences and Workshops**

A Joint Conference, organized by COST G9, WG 1 and 2, and FIG Commission 7 took place December 9.-10. 2004 in Bamberg, Germany. The conference webpage renders the following:

Standardization in the Cadastral Domain - Organized by the ESF initiative COST (European Cooperation in the field of Scientific and Technical Research) Action G9: 'Modelling Real Property Transactions' and FIG (International Federation of Surveyors) Commission 7: 'Cadastre and Land Management'.

One of the big problems in the cadastral domain is the lack of a shared set of concepts and terminology. International standardization of these concepts (that is, the development of an ontology) could possibly resolve many of these communication problems. There are several motivations behind these standardization efforts, such as meaningful exchange of information between organizations, or efficient component-based system development through applying standardized models.

It should be emphasised that a cadastral system entails land registration, the 'administrative/legal component', and (geo referenced) cadastral mapping, the 'spatial component'. Together, these components facilitate land administration and a land registry/cadastral system provides the environment in which this process takes place.

Data are initially collected, maintained and, probably the most relevant issue in standardization disseminated in a distributed environment, which in principle means that data could be maintained by different organizations, such as municipalities or other planning authorities, private surveyors, conveyancers and land registrars – depending on the local traditions. Standardization of the cadastral domain is in the initial phase and many non-co-ordinated initiatives can be identified.

The conference provided a joint forum for research, administration, and industry. The titles of presentations at the conference were rendered above, while digital versions are available from the International Office of Cadastre and Land Records ([OICRE](#)), which is a study and documentation centre for cadastre, land administration and affiliated fields of interest.

### 6.3 Website

The website at <http://costg9.plan.aau.dk> comprises of a menu and the mainframe. The menu includes the points: • Project ToR [Technical Annex] • Organisation [MC members] • WGLawModel • Scientific Missions, and • Reading room, providing reference to relevant literature.

The mainframe lists the workshops and MC meetings, with reference to programme details and agendas of MC meetings. Workshop programs mostly present links to digital versions of the presentations.

### 6.4 Scientific and Technical Co-operation

Ongoing activities:

#### **Nordic cooperation, reporting on property registration and transactions**

Nordic agencies concerned with cadastre (and mapping): Fasteignamat ríkisins, Íslands, Kort & Matrikelstyrelsen (KMS), Danmark, Lantmäteriet, Sverige, Lantmäteriverket, Finland, and Statens kartverk, Norge, cooperates with Nordic university staff, including those engaged in the present action from Denmark, Finland, and Sweden. The cooperation project aims at producing reports, which compare the national activities. A report was issued in 2003, cf. the above section 6.1. Presently, two reports are being prepared, which comprehensively describe the property information systems, and the property transactions, respectively. The reports are forthcoming.

#### **Development of new study program in real property law, Belarus**

The Joint European Project within TEMPUS framework: "Development of new study program in real property law" at Polotsk State University (Novopolotsk, Belarus) with support of three European universities participating in the COST Action G9, namely

Royal Institute of Technology (Stockholm, Sweden), Helsinki University of Technology (Helsinki, Finland), and Delft University of Technology (Delft, the NL). The project is the result of the cooperation within the G9 action. It will be completed by September 2007.

### **Land Management programme, at Royal Institute of Technology, Sweden**

Seminar and courses lectured in the context of the Land Management programme at Royal Institute of Technology (Stockholm, Sweden) by G9 action participants, namely from Aalborg University (Denmark), Helsinki University of Technology (Helsinki, Finland), and Delft University of Technology (Delft, the NL), for graduate and PhD students from the Republics of the former Soviet Union.

### **Real Property Law and Procedure in the European Union, at the European University Institute, Italy**

The MC Deputy Chairman contributed to the national Real Property Report for the project 'Real Property Law and Procedure in the European Union', which is coordinated by the Law Department of the European University Institute in Florence. In the same field of comparative law, the Deputy Chair prepares for an expert meeting "Land Law and Land Registration" for the second half of 2006. This will be organised within the frame of the Research School "Ius Commune", a cooperation of four Dutch universities and one Scottish university. Several members of COST Action G9 are planned to participate and present outcomes of the Action.

**Other** (in reverse chronological order, and not mentioning again the co-operation through the 2004 Bamberg conference with the FIG, the EULIS, and GIS industry representatives).

Further examination of possibilities of partnership in order to apply for a 6th Framework Programme project was investigated by a committee set up at the Sopron meeting (Oct. 2003), comprising of the following members: Janis Balodis, Robert Dixon-Gough and Béla Márkus. During 2004, the committee reported at MC meetings.

During 2003, the MC Chairman participated in the WPLA workshop: "Spatial Information Management for Sustainable Real Estate Market - Best Practice Guidelines on Nation-wide land Administration", Athens, 28-31 May 2003, and informed on the ongoing research (Stubkjær: Research contributions towards Guidelines for Land Administration).

In 2002 an Expression of Interest was submitted, in response to Call EOI.FP6.2000 on a Network of Excellence: Modelling Real Property Institutions. The EOI was formally recorded, and is available at [http://eoi.cordis.lu/docs/int\\_27960.doc](http://eoi.cordis.lu/docs/int_27960.doc). The outcome of the EOI exercise was a demonstration of a sustained research interest in the G9 domain and its extension, but also a realisation that the research of the action made a too small volume for independent initiatives, and also did not fit for merging with other initiatives, e.g. on legal ontologies.

Mortgage banks, e.g. as organised by The European Mortgage Federation was by the EOI assumed to be a potential representative of users. During 2002, the MC Chair discussed this with representatives of the Association of Danish Mortgage Banks.

In agreement with the Technical Annex, the Working Party on Land Administration (WPLA) was informed of the G9 action. The WPLA organizes managers of European cadastral agencies and was represented at the 3rd Work-shop of COST G9, Towards a Cadastral Core Domain Model, October 2002 in Delft, the Netherlands. During the

Workshop, a session was performed on European Projects on Cadastral Systems. Presentations were provided on ongoing research within the above mentioned WPLA, the EU supported EULIS project, and the International Federation of Surveyors, FIG, to whom more than half of the institutions of section 4.2 relate, as follows:

- Guidelines on legal and cadastral objects and their identifiers, by Helge Onsrud (WPLA, Norway Mapping)
- European Land Information Systems on line, by Peter Laarakker (EULIS, Dutch Cadastre)
- FIG Initiative for a cadastral core domain data model, by Lemmen (ITC) & Van Oosterom
- Towards a FP6 network of experts: Modelling Real Property Institutions, by Van Oosterom

The EULIS project aims at developing a European Land Information Service; it will provide the possibility of reaching on-line and updated information about land across European borders. (<http://www.eulis.org/>). It thus points to the relevance of the present research.

## 7. ECONOMIC DIMENSION

(List estimate of total manpower expressed in person-year dedicated to the activities of the Action for each year and the total duration of the Action)

Type of activity	2001 and 02	2003	2004	2005	Total pm
<b>Research</b> Papers à 10 p.; Ashgate book 170 p. Natl.Rep.s 96 p.; Bamberg conf. 300 p; Closing book 190 p.; STSM reports à 5p. 1 page/day ; 20 days/month	11 papers, 170x½ p. 195 pages 10 pm	18 papers, 170x½ p., 4 reports 285 pages 14 pm	7 papers, 96+300p., 6 reports 496 pages 25 pm	10 papers, 190 p., 5 reports 315 pages 16 pm	65
<b>Exchange, coordination</b> Per MC+ or WG meeting: 15 participants in 2 days + 2 days of preparation +2 days of travel = 90 days Per STSM: 2 persons in 5 days = 10 days 1 Conference: 50 participants in 2 days + 3 days of preparation + 2 days of travel = 350 days 1 Training school: 11 participants +4 teachers present during 5 days + 5 days of preparation + 2 days of travel = 180 days	3 MC+: 270 days Expression of Interest: 20 days 290 days 14,5 pm	1 MC+, 4 stsm 130 days 6,5 pm	2 MC+, 1 WG, 6 stsm: 420 days 1 Conference: 350 days 680 days 34 pm	2 MC+, 2 WG, 5 stsm: 530 days 1 Training school: 180 days 590 days 29,5 pm	85
<b>Administration</b> Chair, deputy chair, wg chairs, conference org.	2 pm	3 pm	5 pm	5 pm	15
<b>Total: National COST G9 activity</b>	31 pm	25 pm	68,5 pm	56,5 pm	165

The estimated total of 165 person months may be compared with the expectation of the Technical Annex of 170 months.

## 8. SELF EVALUATION

The self evaluation is presented in three parts: 1. an abstract, 2. a description of the action outcome, both based on our present judgment, and 3. comments to statements made in the Technical Annex of the Memorandum of Understanding.

### 8.1 Post-action abstract: Modelling Real Property Transactions - COST action G9

The COST action addresses the segment of society concerned with real estate. New Institutional Economics provides a theoretical frame, specifically the notion of transaction costs, leading to the main research question: What are the costs of

transactions related to real property? Methodologies developed and applied include the modelling of institutionalised behaviour and legal notions regarding real estate, while initial analyses were made towards the establishment of national (satellite) accounts of the real estate segment.

Outcomes include formalised description of change processes: purchase, subdivision, and mortgaging in a handful of European countries, as well as estimates of transaction costs. The modelling effort included ontology based analyses of the change processes. As important is, however, that research questions are raised and corresponding methodologies developed, which only now enables research at PhD-level. The cost-related methodology may - within the domain of real estate - inform ongoing economic analysis of the professional services market and the further collection of statistics on business services, cf. the Commission communication on professional services, COM(2005) 405 final. More general change of practise depends on further studies and the political/ professional commitment towards reduction of transaction costs.

Furthermore, the COST action has provided added value in terms of consolidating scattered research efforts across the EU. The COST action has made an 'invisible faculty' emerge through workshops, Management Committee meetings, and through the Short Term Scientific Missions, where young staff have addressed an aspect of the G9 research domain in dialogue with senior staff at the hosting institutions. The dominant group of action participants is involved in university education of geodetic surveyors. This education includes a remarkable amount of legal-administrative issues, but at the technical universities, who mostly hosts the education it is difficult to establish a research group of a sufficient size. Aiming at institutionalising the 'invisible faculty', the action has also supported the performance of a one-week Training school/PhD course: Cadastral Development - The Contribution of Scientific Enquiry, as well as a recent proposal of a one-term module of master level study of European scope.

## **8.2 Findings, based on our present judgment**

### **Achievements**

The output from the COST action in a field, where publication structures are not well organized and publications scattered, was very good; the action in general raised the level of publication produced in all participating institutions. The publication structure may be grouped in several strands. The oldest strand is the teaching material of largely legal and national scope, prepared for university education of the professionals concerned. A more international strand emerged after developing countries with donor assistance wanted to increase their economic performance. This strand largely took an information systems approach, while aiming at the introduction of Western institutions in the development countries (Feder, 1988; quoted in several textbooks; Reports of the FIG, the International Federation of Surveyors; Deininger, 2003). The insights of New Institutional Economics (e.g. North, 1990; Scott, 1995) provided a more adequate theoretical base for such efforts, when adopted to development abroad and within Europe, as it allowed the addressing of legal and organizational issues without being bound by the national legal and organizational settings. Furthermore, research in information systems and knowledge engineering permit applications of the technology for mapping (including remote sensing and GPS, global positioning systems) and for computing (GIS, geographical information systems), as well as the corresponding standardisation efforts, e.g. in terms of the ISO 191xx-family of standards, and specifically the proposal for a Cadastral Core Domain Model, (Lemmen, et al, 2003). Finally, the present action is integrated with a

more analytical approach to cadastral systems (Frank, 1996; Stubkjær, 1999; Bittner, 2001; Navratil, 2002; Silva, Stubkjær, 2002; Zevenbergen, 2002; Silva, 2005).

Legal terminology is largely bound to national language, and comparative law is only emerging in this field, cf section 6.4. The methods of computer science, which we intended to apply, appeared partly to have a steep learning curve (UML), partly needed improvement to fit our purpose. The action was successful in revealing limitations of current methods to describe formally or informally procedures with the intention to compare them; it also provided good examples where current methods are challenged.

The methodological difficulties were identified at the first workshop and produced cooperation between Schlieder and Frank, reaching outside the scope of the action to the community that discusses spatio-temporal ontologies and specification languages. Focusing on the UML-based methodologies, alternative approaches to the eliciting of ontologies (Kuhn) were not used.

Outcomes of the action include new and more elaborated research questions. At the mid-term presentation of the action to the TC SSH, the following research questions were mentioned:

- What are the costs of transactions related to real property?
- What are the factors influencing these costs?
- What are the main transactions?
- How are rights in land described?
- What is a unit of real estate?

The latter three questions have been described in sufficient detail to make close comparisons between European countries. These comparisons raised new questions, like:

- What are the objectives of the different (sub-)processes, which contributes towards the transactions?
- What infrastructure and other resources are needed for achieving the mentioned objectives? What is the cost of providing this?
- What array of options is available for achieving each of the stated objectives?
- and What is the relative potential for achieving a change towards more efficient transactions?

Transaction costs have been estimated, especially in comparisons between Finland and Slovenia, and Slovenia and Denmark. Two different approaches were explored, and a third identified. This effort provides a new basis for rephrasing research questions, which were stated in the Technical Annex, more precisely:

- What are the most important variables that determine resource costs?
- How do the variables and resources relate in terms of a model, which explains the transaction costs?

Indirectly the action contributed towards the founding of a new international, peer reviewed journal (Nordic Journal of Surveying and Real Estate Research; founding editor Kari Leväinen, former Finnish MC delegate to the action). The COST action was, in our assessment, very successful in the increase in young researchers with a focus on cadastre and procedures: Where there were none a few years ago, we have now a handful of young PhD. researchers.

## **Participation**

The COST action brought together researchers from diverse communities; some knew of each other, but many new contacts were established. Unfortunately, the integration of researchers with an economic background was hindered, both organizationally by the COST representatives in some countries and by the very high demand on researchers in economy. We consider the achieved opening as very positive and the cadastre community benefited from the contributions made by economists.

## **Added value**

The COST action demonstrated the importance of the topic, both within the European Union and its contribution to integration of socio-economic processes and with respect to the countries intending to join. The comparison of procedures in different countries leads to a better understanding of the similarities and differences between systems, which in the long run influences their development by copying effective methods and eventually leading to more transparency and uniformity. Over the time of the COST action, we also saw emerge an interest in the World Bank in understanding basic concepts and a drive towards simplification of the legal rules and principles. The results of the action and the communication of the participants with other communities during the action seem to have contributed to the discussion at large and influence its course.

We assess the COST G9 action as very successful, comparing the resources made available and the achieved output.

## **8.3 Comments to statements made in the Technical Annex**

The comments on quotations of the TA are grouped under various headings, depending on the degree to which the tasks have been completed.

### **Stated methodology, which proved feasible**

- Description and comparison of the national variety of forms of land tenure in a way that relates to the major transaction types, and description of these transaction types (conveyance of title, mortgaging, compulsory acquisition, as well as subdivision, etc.)
- Quasi-formal modelling based on the above investigations
- Development of formal methods, which are feasible for modelling property transactions with a national scope. Provision for semantic translation between different datasets will be made, with a view to the following comparative analysis. - The translation was achieved by using English as the common language.
- Application of the developed methods on few, selected countries: probably Denmark, Sweden, the Netherlands, Austria and Slovenia, and maybe further country(ies). - In fact, Finland, Hungary and Greece, as well as a number of STSMs by Marina Vaskovich have contributed substantially in this respect.
- Studies of literature, occasional visits, and interviews in order to clarify the operation of the ever-developing technical systems. Descriptions are circulated between participating countries, with a view to increase completeness and correctness from a legal point of view. - The STSMs have substantially contributed to this.

### **Stated research tasks, which were mostly completed**

- Description and comparison of national land databases (or datasets, if not yet computerised), and updating information flows. – By Hungary, Greece, the Nordic project
- Investigation in quantitative terms of the transactions, and of the content of databases/-datasets. - Database modelled by the Netherlands (the Core Cadastral Domain Model), and by Greece
- Establishment of taxonomies of technical terms. - Tiainen, Finland, on EULIS glossary approach.
- Members of the working group Ontology are expected to meet for 1-2 periods of 2-3 days at an appropriate research facility, in order to draft alternative ontologies, and to overcome the linguistic differences of sources of evidence. – A WG3 meeting, March 2004, provided for hands-on training. During autumn 2004 and 2005 ontologies were developed in German-Dutch and German-Greek cooperation.
- Several participants of the action research are expected to learn the formalisation techniques as part of the action, and to develop teaching material during this process. - Especially PhD students have adopted the techniques; research has influenced teaching material.
- The validity of the operationalisation of the theoretical constructs in the transaction costs and property right theories will be assessed by means of discussion with relevant colleagues and interviews with informed respondents.

–

### **Stated research tasks, which were not accomplished**

A number of research tasks were included in the Technical Annex, some of which were addressed in a restated form, while other tasks demanded resources beyond the available.

- The effects of the property transactions shall be taken into consideration, with a view to assess the economic efficiency of the transaction processes.
- The comparative analysis is followed by an explorative analysis of the causes of economic efficiency. ..
- the development of an economic model of the systems, which contain the most important variables that determine the resource costs of the various systems. These variables will be derived from the analytical apparatus of transaction costs and property rights economics, ...
- a comparative analysis of the economic efficiency of transactions...will be presented, supplemented by an exploratory analysis of relations between transaction costs and national practices regarding land management, education and governance
- ...will include an identification of these effects and an assessment of their impact on the economic efficiency, including an assessment of the value of transaction information for further purposes.

In closing, mention is made that this detailed reporting is done to learn from the research action, to get better grips on the research domain and its potential questions. The contribution by action participants has been generous and adequate according to all standards we know of.

## 9. EVALUATION

### 9.1 Evaluation panel, evaluation procedures and activities

#### 9.1.1. *Evaluation panel:*

The following evaluation panel was appointed by the TC through a procedure via e-mail in September 2005:

#### *External experts:*

1. Professor Robert LAURINI  
LIRIS - Bât. Blaise Pascal, INSA de Lyon , F - 69621 Villeurbanne Cedex,  
France, [Robert.Laurini@insa-lyon.fr](mailto:Robert.Laurini@insa-lyon.fr)
2. Professor Hans SEVATDAL,  
Dept. of Landscape Architecture and Spatial Planning, Norwegian  
University of Life Sciences, N - 1432 Ås, Norway, [Hans.Sevatdal@umb.no](mailto:Hans.Sevatdal@umb.no)

#### *Rapporteur (TC SSH / DC ISCH):*

Professor Danica FINK-HAFNER  
Faculty of Social Sciences, University of Ljubljana, Kardeljeva ploscad  
5, 1000 Ljubljana, Slovenia, [danica.fink-hafner@quest.arnes.si](mailto:danica.fink-hafner@quest.arnes.si)

On 15 February 2006 Prof. Robert Laurini stepped down as an evaluator due to his appointment as Director of the Lyon International College for Doctoral Studies and his visiting professorship at the University of La Plata, Argentina.

#### 9.1.2. *Evaluation procedures and activities:*

The Final Report was prepared by Professor Sevatdal and Professor Fink Hafner on the basis of the following sources of information and insights into the G9 action:

- a) information exchanged via e-mail between the evaluators and COST officers;
- b) information exchanged via e-mail between the evaluators and the Chair of the G9 MC, Professor Erik Stubkjær;

c) on the basis of files presented to evaluators on CD (Attachment);

d) by taking into account the participation of Prof. Fink-Hafner at the Thessaloniki meeting in 2005 and Prof. Sevattal's participation in the Committee meeting in Stockholm on 14 and 15 October 2005. (Both evaluators had the opportunity to follow the proceedings and discussions at the mentioned conferences/meetings, pose questions and hold conversations with individual members of the action on topics relevant to the evaluation);

e) by incorporating Prof. Sevattal's insight into the process and results of filling in the questionnaire "Final evaluation of cost FFP actions - evaluation checklist" at the meeting in Stockholm (the list was completed by 16 participants and copies were given to Prof. Sevattal. The following topics were listed in the questionnaire, with possible scores for each of them ranging on a scale from "excellent", "good", "fairly good", "poor" to "bad": Achievement of objectives; Added value aspects; Management aspects; Dissemination aspects; Participation aspects; Economic aspects; Overall Assessment). In addition, many participants took the opportunity to make separate comments on the various topics);

f) by taking into account Prof. Sevattal's insight into G9 activities of the Training School within the framework of the Cost G9 Action; Cadastral Development - The Contribution of Scientific Enquiry - 2 to 6 May 2005 in Aalborg, Denmark. Professor Sevattal attended it as an invited lecturer and had the opportunity to discuss with both the attending PhD students and staff and to thereby form opinions relevant for the evaluation.

### **9.1.3. Documents**

The studying of documents comprised the most important part of the evaluation. This documentation covers the whole range from the Technical Annex and administrative programmes for workshops, participation lists etc to scientific reports, like the very important "Bamberg Proceedings" through to papers and other materials presented at the workshops and meetings. A CD containing – as far as we can see – the most important parts of this material has been made available to us by a conveyance from the Chairman, Professor Erik Stubkjær on 15 February 2006. This is a most valuable

and very useful source of information on the action activities and the results. The document "Evaluation Report", Cost G9 Version 21 December, page 1-27, has also been very valuable especially since it contains a structured list of publications. Some publications like "Standardisation in the Cadastral Domain " and "The concept of real property rights in the Nordic countries" were well known to the evaluator prior to the evaluation, while others were partly read in their entirety and partly reviewed through abstracts and summaries.

## 9.2. Results versus objectives

The main objectives of the Cost Action G9 are in line with the *applied* character of cadastral research:

- to improve the transparency of real property markets; and
- to provide a stronger basis for reducing the costs of real property transactions.

The underlying motivation then is that "governments, professions, and holders of property rights get a better basis for reducing the costs of the transactions of markets of real estates", cited from page 3 of the Evaluation Report.

The *means* to obtain these goals are:

- to prepare, or better put construct, a set of *empirical* models of real property transactions that are empirical in the sense they should be correct in relation to the "real world". They should also be formalised and complete according to stated criteria.
- Real world transactions captured in the form of these formalised, correct and complete models will then be studied and assessed in terms of economic efficiency, captured within the concept of "transaction" costs.

On page 10 of the evaluation report the general aim for this element is stated: "The purpose of the modelling effort of the COST G9 action is precisely to uncover components or configurations that make the cost differ".

The various documents stress many times, for good reason, that the models must be valid from ontological and legal perspectives. This means the models must capture the "truth" both in relation to the very nature of real world transactions and in relation

to the legal systems in the jurisdictions involved (countries). At the same time, they must be standardised to such a degree that they can be utilised in comparative studies of efficiency in economic terms, i.e. the action has concentrated on the three most important transactions; purchase, subdivision and mortgaging.

These relatively ambitious objectives could (alternatively) be applied to a research project, a research programme or, as is the case here, to the Cost Action. Applied to the Cost Action G9, as we understand it, this means to initiate, inspire, enhance and organise arenas for researchers, including PhD students, to meet and discuss. In short, this involves some sort of "orchestrating" or "co-ordinating" of research efforts among the participants along these lines, as well as disseminating the results.

Our overall assessment is that the G9 action has achieved its objectives to a significant extent. The assessment of the participants themselves varies between "good" and "excellent", we will put a major emphasis in this respect on the very impressive list of scientific publications and their quality, as well as the activities the action has initiated.

### **9.3 Outcome and achievements**

In our judgement, the main outcomes are as follows:

- A better insight and understanding of the *institutional arrangements* that frame the real property transactions in the jurisdictions studied. One may say that the action has produced "know how" regarding which elements influence the transaction costs in a positive way and which in a negative way. Still, how this could be achieved in the real world remain political questions, sometimes of a sensitive nature.
- The action has produced very good results in developing methodology for studying land registration and real property right issues by the application of the bundle of theories (variously) named "political economy", "theory of institutions" and "legal economy", as well as "transaction cost theory". These have for a long time been gaining momentum in several social sciences, as well as in economics, and hold in our assessment huge untapped potential for being applied/utilised in the fields of property transaction, land registration and related issues like, for example, land consolidation. This lagging behind in our field is probably due to the dominance of the technical orientation of the profession and the education

and research activities in academic organisations/universities in this field. The action has, so to speak, taken a huge step to open up for the fruitful application of theories developed in the social sciences and economics, to develop research tools and concepts in "our fields". In this sense, the outcome is the possibility of more elaborate research in the future. In the wording of one participant "the project has opened our eyes to the differences in Europe, but it has also shown it is possible to model the differences". For our part, we would add that the approach could very well be applied in other parts of the world, not the least in developing countries.

- The action has produced and disseminated publications that can directly and indirectly be used as "textbooks", especially at an advanced level (master's and doctoral levels) at universities.
- The general dissemination of results is very good and in a form that is easily accessible.

#### **9.4 Impact of the Action**

The importance and benefits for international science:

- It has created a European network.
- It has made a major contribution to the application of institutional theory and transaction cost theory to this type of research.
- It has developed a methodology for fruitful comparative analyses across countries and jurisdictions and, we should add, over time.

#### **9.5 European added-value**

The Action used the COST framework to consolidate the scattered research efforts in the various countries. This aspect achieved a remarkably high score in the questionnaire among the 16 participants at the Stockholm meeting in October 2005, where many responded with "excellent" and good". It is obvious that the action has offered a major contribution to the setting up of projects, both nationally and internationally. The list of activities and publications underpins and confirms this conclusion. It is also quite logical; the research groups in this particular academic field are small and they live a somewhat "lonesome", or at least isolated life at

universities dominated by other, especially technological environments. Interdisciplinarity is a well valued but remarkably rare phenomenon at academic institutions. We think the phrasing that the "Cost action has made an 'invisible faculty' emerge ..." (evaluation report p. 23) is fully justified.

## **9.6 Co-ordination and management**

The co-ordination and management of the action seems to have mainly been the task of the Chairman where he has obviously done a great but quite lonesome job. Comments to this effect were mentioned by the participants.

## **9.7 Dissemination of the results**

Dissemination of the results and the accessibility of papers received a high score among the participants. Some claimed that the publication and dissemination of results of the meetings have taken too much time. However, at the conclusion of the action our assessment is that the list of activities and publications in an easily accessible form is impressive and confirms the general picture namely that the action has also been successful in this respect.

## **9.8 Strengths and weaknesses**

- **Strengths:** The strengths lie in the method and theory. The development and application of the uniform modelling of transactions in different countries worked; it was shown that it is possible. Second, the application of the institutional, theoretical approach described above in paragraph 9.3, especially transaction cost theory which is closely related to institutional theory, has been successfully applied, and was probably more important - it was shown to hold potential for the further development for future research.
- **Weaknesses:** The absence of "other" professions, with an exception made for economics. Facilitating efficient transactions (purchase, mortgaging etc) with real property and property formation (subdivision, amalgamation etc) are generally accepted as very important in society and should ideally call for research interests from a wide variety of academics and professions, especially when applied to development issues. Unfortunately, that is not so. On the contrary, it seems to be very difficult

to involve academics and professions outside the surveying profession, with the exception of a few researchers in economics and law. Research in this field has the potential for far wider attention and interest, ideally it should be interdisciplinary. The general experience is that this is very difficult to bring about, hence the cumbersome need for surveyors to make themselves sufficiently familiar with theories and methods from various fields. We do not know the extent to which efforts have been made to involve other faculties as well, and we do not know to what extent that might have added value to the action. Efforts in this direction might have been worth trying and should probably have been mentioned in the evaluation report.

### **9.9 Recommendations**

The momentum created by the action should somehow be followed up. This should be achieved through several different types of activities, but one obvious way is to organise a follow up Cost Action utilising the experience, network and methods developed by Action G9. A most suitable and quite urgent issue is the process, collectively but not very precisely known as "land consolidation". We find this type of formalised "transactions" in most European countries, but almost everywhere they have developed within relatively different institutional, economic and social frameworks than we find today. So our recommendations are to: a) support the publication of a book, which summarizes research in frame of Action G9 (the Action team has already asked for Cost financing of the book to be published by the IOS Press, Amsterdam) and b) to set up a new Cost Action as soon as possible to address this issue through further development of the same lines as Action G9. One final and perhaps too specific scientific detail: we would recommend that efforts along these lines should encourage a further search for an even broader theoretical base, most notably a theory on negotiation and mediation.

## **APPENDIX**

A CD with files presenting the Action G9 activities were sent to the COST office by registered mail on the same day it was sent to the evaluators (15 February 2006).

## **10. Remarks by the Domain Committee**

The Committee warmly commends Action G9. In this Action, a network of technical specialists in land surveying and related disciplines had the vision to seek to model one of society's most pervasive and fundamental socio-technical systems: the concept of real property rights, and the complex of legal and professional structures underpinning it. The outcomes have important implications for Europe and other developed regions, in terms of market efficiencies and the treatment of property transactions in national accounts. They also have important implications for the developing world, where the lack of secure title to real property has been identified as a major factor in the perpetuation of poverty.

The researchers have developed a methodology for fruitful comparative analysis across countries and jurisdictions and over time. They have made useful contributions to the application of institutional theory and transaction-cost theory. They have stimulated the formation of an 'invisible faculty' from many scattered disciplines and pockets of research. Unfortunately, the integration of researchers with an economic background was hindered, both organizationally by the COST representatives in some countries and by the very high demand for researchers in economics. The achieved opening was nevertheless very positive, and the cadastre community benefited from the contributions made by economists. Other disciplines and professions which could contribute usefully, including public notaries, have not so far engaged with this approach.

The dissemination of results has been exemplary. In particular, several publications have been produced that can be used directly in higher education courses up to doctoral level, thereby ensuring that the next generation of technical specialists in the relevant disciplines are aware of the broad socio-technical context of their specialism, and are able to make use of such perspectives in their professional careers.

The Committee hopes for significant follow-on activity, perhaps including proposals to Framework Programme 7 which would enable this approach to be pursued in the context of developing countries.