

REAL CORP 2009

14th International Conference on Urban Planning, Regional Development and Information Society

Manfred SCHRENK, Vasily V. POPOVICH
Dirk ENGELKE, Pietro ELISEI
(Editors/Herausgeber)



smart sustainable integrative

**Strategies, Concepts and Technologies
For Planning the Urban Future**



**22 - 25 April 2009
Centre de Disseny de Sitges
Catalonia/Spain**

**PROCEEDINGS
TAGUNGSBAND**



CEIT ALANOVA
Institute of Urbanism,
Transport, Environment
and Information Society



Ajuntament
de Sitges

C O R P

Kompetenzentrum für
Stadtplanung und Regionalentwicklung



Competence Center of
Urban and Regional Planning | www.corp.at



ISOCARP

REAL CORP 2009: CITIES 3.0 – Smart, Sustainable, Integrative.

Proceedings of

14th International Conference on Urban Planning, Regional Development and Information Society

Beiträge zur

14. internationalen Konferenz zu Stadtplanung, Regionalentwicklung und Informationsgesellschaft

Edited by

Manfred SCHRENK, Vasily V. POPOVICH, Dirk ENGELKE, Pietro ELISEI

Schwechat, 2009

CD-ROM-Edition ISBN: 978-39502139-6-6

Print-Edition ISBN: 978-39502139-7-3

Im Selbstverlag des Vereins

CORP – Competence Center of Urban and Regional Planning

Kompetenzzentrum für Stadtplanung und Regionalentwicklung

Lerchergasse 4, A-2320 Schwechat-Rannersdorf

office@corp.at, <http://www.corp.at>

REAL CORP 2009

TEAM

Manfred SCHRENK
Clemens BEYER
Christian EIZINGER
Gert DELLE KARTH

Stephanie RÜSCH
Kathi MITTERER
Jon Alejandro PUEYO
Katja ROSNER

All rights reserved. – Alle Rechte vorbehalten.

Editors– Herausgeber:

DI Manfred SCHRENK, Lechergasse 4, A-2320 Schwechat-Rannersdorf, Austria

Prof. Dr. Vasily V. POPOVICH, SPIIRAS, St. Petersburg, Russia

Dr. Dirk ENGELKE, pakora.net - Netzwerk für Stadt und Raum, Karlsruhe, Germany

Dr. Pietro ELISEI, PLANUM, Uni Roma Tre, Rome, Italy

Publisher – Medieninhaber und Verleger:

CORP – Competence Center of Urban and Regional Planning

Kompetenzzentrum für Stadtplanung und Regionalentwicklung

Lechergasse 4, A-2320 Schwechat-Rannersdorf

office@corp.at, <http://www.corp.at>

CD-ROM-Edition: ISBN 978-39502139-6-6

Print-Edition ISBN 978-39502139-7-3

Contributions by the authors reflect their own findings, views and opinions
which may not necessarily be consistent with the views and opinions of the editors

Die Arbeiten geben die Erkenntnisse und Ansichten des jeweiligen Autors wieder
und müssen nicht mit den Ansichten der Herausgeber übereinstimmen

Table of contents – Inhaltsverzeichnis:

Advanced analysis of spatial multi-functionality to determine regional potentials for renewable energies	15
Ulrike Wissen, Adrienne Grêt-Regamey	15
Are landmarks essential to the city – its development?.....	23
Anthony Clerici, Izabela Mironowicz	23
Autostereoscopic Visualization of Landscape - a Research Project	33
Dirk Stendel	33
Climate Change and the Resilience of Megacities in South-East-Asia Creating Risk-Based Climate Change Information for Ho Chi Minh City’s Settlements	45
Harry Storch, Nigel Downes, Kiduk Moon	45
Competence and performance.....	55
Konstanze Noack	55
Concentration of knowledge-based professions in the German city-system.....	59
Anna Growe	59
Cross-border Region Graz-Maribor: Challenges and Potentials of Integration Processes.....	73
Kaja Pogačar, Metka Sitar.....	73
Die Verschmelzung von realer und virtueller Umgebung in der City3.0.....	83
Arne Siegler, Ingo Wietzel	83
Energy Efficiency and Solar Renewable Energy through Minimalism	97
Dragana Vasilski,, Svetlana Stevović.....	97
Entwicklungsdynamiken und Handlungsoptionen von Städten im Strukturwandel	105
Heike Liebmann	105
Environmental Impact Assessment, a tool for Sustainable City Management	111
Sanhita Bandyopadhyay, Piyali Bandyopadhyay, Papiya Bandyopadhyay Raut	111
Erfolgsfaktoren für eine innovative Positionierung von Städten und Regionen	127
Kirsten Mangels	127
Explore the spatial equity of urban public facility allocation based on sustainable development viewpoint	137
Chin-Hsien Liao, Chang Hsueh-Sheng, Ko-Wan Tsou	137
Exploring Crime Hotspots: Geospatial Analysis and 3D Mapping.....	147
Markus Wolff, Hartmut Asche	147
Flächenmanagement unter Schrumpfungsbedingungen in der Region Halle-Leipzig	157
Anja Brandl, Christian Strauß, Barbara Warner	157
GIS-based evaluation of public facility provision to achieve improved governance and equitable service delivery.....	167
Chéri Green, Ken Breetzke, Gerbrand Mans.....	167
Green Spaces 3.0 – CAD-Fachapplikationen als wissenschaftsbasierte Werkzeuge für die Landschaftsarchitektur am Beispiel der Bepflanzungsplanung.....	177
Marcel Heins, Wolfram Kircher, Einar Kretzler, Christian Schultze	177
Green Spaces 3.0 – Qualitätsmanagement für die nachhaltige Sicherung der Funktionsfähigkeit von Grünflächen in urbanen Räumen	187
Marcel Heins, Matthias Pietsch	187
Green Spaces 3.0 – Wissensmanagement zur Planung, Bereitstellung und Bewirtschaftung urbaner Vegetation durch Kommunikations- und Informationstechnologien.....	197
Marcel Heins, Wolfram Kircher.....	197
‘Green Urban Catalyst’: An Ex Post Evaluation of Sustainability Practices	207
Maria Cerreta, Ilaria Salzano.....	207
HOUPLA – Holistic Urban Planning in the Bizkaia Technology Park	223
Borja Izaola, Igone Revilla.....	223
Implementation of Sustainable Urban Transport Measures and their Political Dimension	233
Oliver Roider, Tina Uhlmann.....	233
Indicators for Socially Sustainable Park Use – Results from a Case Study.....	243
Frank O. Ostermann	243
Infrastructure Acquisition and 3D Virtual Integration	253
Gerd Hesina, Bernd Leitner, Stephan Mantler, Friedrich Brimmer.....	253
Innerstädtisches Entwerfen in der City3.0.....	261
Henning Stepper, Ingo Wietzel	261

Integration of Vessel Traffic Control Systems and Geographical Information Systems	271
Vasily Popovich, Christophe Claramunt, Vasily Osipov, Cyril Ray, Tianzhen Wang, Dmitry Berbenev	271
Land uses allocation as key to city’s environmental improvement.....	285
Ioannis. Tsouderos, Despina Dimelli.....	285
Landesweite 3D-Stadtmodelle im Internet auf Basis offener Standards des Open Geospatial Consortiums (OGC) - das Beispiel Nordrhein-Westfalen 3D	293
Robert Kulawik, Arne Schilling, Alexander Zipf.....	293
Langfristige Bürger/-innenbeteiligung - ein Beitrag zur nachhaltigen Stadtentwicklung	303
Franz Brunner.....	303
Liveable City TP. Ho Chi Minh - Adaptation as response to impacts of climate change	313
Ronald Eckert, Ulrike Schinkel	313
Local Developmental State? State-led Entrepreneurial City? Deconstructing Shenzhen’s Pathway of Local Growth Political Economy Pressed by Pearl River Delta Intercity Competiiton	325
Cassidy I-Chih Lan.....	325
Mapping people? – The measurement of physiological data in city areas and the potential benefit for urban planning.....	341
Peter Zeile, Stefan Höffken, Georgios Papastefanou	341
Methodology of target and requirements management for complex systems concerning the application field of an energy-efficient city	353
Karsten Rexroth, Thilo Brüggemann, Petra von Both	353
Mofist – Mobile field survey tool for conversion areas	361
Inga Scheler, Hans Hagen.....	361
Monitoring und Visualisierung von Carbon Footprints im urbanen Raum	371
Sebastian Petsch, Luc Heischbourg, Kerstin Müller, Subhrajit Guhathakurta, Hans Hagen.....	371
Nachhaltige Entwicklung von Megacities: Energieeffiziente Strukturen für die Region Shanghai am Beispiel des Distrikts Fengxian	381
J. Alexander Schmidt, Jörg Schönharting, Hannah Baltes, Sabine Drobek, Marco Schuhmann	381
New Urbanism in Historic City Centers? The Glocalization of Vienna’s Historic City Center as an Art and Cultural Hub	391
Gerhard Hatz	391
Patch – Switch – Stratus. An insight into infrastructural spatial mediation strategies in contemporary Lisbon metropolis..	403
João Rafael Santos.....	403
Places on the Net	413
Ileana Apostol, Panayotis Antoniadis, Tridib Banerjee	413
Plants in Architecture and their Integrative Role in Energy Efficacy	423
Svetlana Stevovic, Dragana Vasilski	423
Public Participation and Urban Planning supported by OGC Web Services.....	431
Joachim Benner, Thomas Eichhorn, Andreas Geiger, Karl-Heinz Häfele, Kai-Uwe Krause	431
Public Transport Systems Development for Urban Regeneration – Evidence from the City of Linz/Austria.....	439
Roman Klementschtz, Juliane Stark	439
Railway Stations of the Future – Services supporting Intermodal Travelling and Promising Strategies for their Development	449
Juliane Stark, Tina Uhlmann	449
Simulation städtischer und touristischer Flächenexpansionen als Grundlage für eine nachhaltige Entwicklung – Fernerkundung und GIS als Planungsinstrumente	459
Simone Naumann	459
Strategische räumliche Ziele für den Planungsprozess unter Schrumpfungsbedingungen.....	469
Christian Strauß.....	469
Study of the exploration of fire occurrence spatial characteristics and impact factors – A Case Study of Tainan City.....	477
Hsueh-Sheng Chang	477
The Eco-efficiency Assessments of Hazards prevention in Urban Parks of Taiwan	483
Hui-Wen Huang, Hao-Hsuan Huang, Hsueh-Sheng Chang.....	483
The End of Master Plan: New Collage Cities of Future	489
Anand Wadwekar, Hidetsugu Kobayashi	489
The New Urban Acupuncture: Intermodal Nodes between Theory and Practice.....	499
Aleksandra Stupar, Vladimir Savcic.....	499
The riddled city – where demographic change adds to the woes of urban sprawl.....	507
Stefan Fina, Stefan Siedentop.....	507

The role of the informal sector in contributing to the urban landscape in Yogyakarta – Indonesia concerning on the urban heat island issue	519
Suparwoko Nitisudarmo	519
The Social Impact of Urban Waterfront Landscapes: Malaysian Perspectives	529
Salina Mohamed Ali, Abdul Hadi Nawawi	529
The study of green space ecological benefits of Chiayi City.....	535
Hao-Hsuan Huang, Hui-Wen Huang , Hsueh-Sheng Chang	535
The Use of Urban Planning Consultancy as a Communication Tool for Cities	541
Cinthya Uribe-Sandoval, David C. Prosperi.....	541
Universität in der Stadt - Räume für die Wissensgesellschaft	551
Kerstin Gothe	551
Urban Crafting: Making a Connected City	561
Reena Tiwari	561
Urban simulation Using Neural Networks and Cellular Automata for Land Use Planning	571
Hamid Kiavarz Moghaddam, Farhad Samadzadegan	571
Walkable Urban Green Spaces: Health Impact Assessment in Amadora, Portugal	579
Paula Santana, Rita Santos, Cláudia Costa	579
Adding Value on Geospatial Data Infrastructure with CommunityViz Future Growth Scenarios of Local Communities in Suburb of Warsaw, Poland.....	589
Pawel Decewicz	589
AIRCLIP – Airports and Climate Preservation	591
Manfred Schrenk, Stephanie Rüsçh, Gregor Wiltshcko, Andor Farkas, Christian Eizinger.....	591
An analysis of the Hungarian major cities and their territories and their opportunities of development	597
János Rechnitzer, Bálint Filep.....	597
Aspern, Vienna’s Urban Lakeside	603
Claudia Nutz, Kurt Hofstetter	603
Biotope Mapping in Korea. History of biotope mapping and consideration of a new method	613
Soo-Young Moon, Hyun-Soo Kim, Yeon-Mee Kim, So-Yeon Bae.....	613
Bus Stop 3.0 – Multifunctional Centers for Regional Development	619
Manfred Schrenk, Josef Benedikt, Clemens Beyer; Christian Einzinger, Andor Farkas, Gert Delle Karth	619
Cadastral Management System with utilities and facilities. A Case study of Model Town Lahore	625
Muhammad Nawaz Mian	625
Can we capture the imaginary dimension of cities?	627
Olivier Lefebvre	627
Centropemap - Information Infrastructure for a dynamic cross-border region in the heart of Europe	633
Manfred Schrenk, Clemens Beyer, Walter Pozarek	633
Concept of appropriate economic environmental modelling for sustainable development.....	641
Papiya Bandyopadhyaya Raut, Sandeep Kumar Raut	641
‘Cultures of Legibility’ As a Complementary Approach to Site Planning For Southeast Asian Cities: A Case Study of Kuala Lumpur	643
Dazilah A. Samad.....	643
Delhi – Towards a Green City	655
Bijendra K. Jain.....	655
Demographic challenges for urban mobility and public space	667
Herbert Bartik; Siegrun Herzog.....	667
Der Punkt als Netzwerk. Anmerkungen zu raumstrukturellen Bewertungsmethoden.....	671
Josef Benedikt	671
Digital Guidance & Information System in Schwechat, Austria	675
Manfred Merten	675
Evaluation of sustainable regional land use	681
Vladimira Šilhánková, Michael Pondělíček	681
Exploring the people's perception of urban public parks in Tehran	687
Zohreh A. Daneshpour, Asrin Mahmoodpour	687
Finding new patterns to design sustainable cities by use of traditional urban patterns.....	693
Anahita Mahmoudi, Kamyar Fanaei	693
Geological data infrastructure for spatial planning in Poland	705
Jacek Kocyla	705

Government, governance, mediation, participation and planning. About the interface between planning service provision and citizens. The tale of two capital cities: Madrid and London.....	709
Judith Ryser, Teresa Franchini	709
Hauptgebäude einer Kulturhauptstadt.....	711
Andreas Treusch, Nadja Sailer	711
HUB 53/12° – das Logistiknetz Güstrow – Prignitz – Ruppin	717
Jochen Richard, Hilde Richter-Richard	717
Improving Slum Conditions with Public Private Partnerships.....	723
Tina Chang	723
Innovative Stadtplanung als Prozessgestaltung – am Beispiel Musterprojekt „Generationen_ wohnen am Mühlgrund“.	729
Sabine Gretner	729
Innovative web-based tools for participatory planning.....	731
Stefano Magaudda, Giuseppe De Marco, Flavio Camerata	731
Kommunales Handeln beim Flächenmanagement.....	737
Anja Brandl	737
Manage and planning sustainable city case study Tehran metropolitan	743
Farzaneh Sansapour	743
Mapping Biotope and Sociotope for Green Infrastructure Planning in Urban Areas	745
Wan-yu Shih, John Handley, Iain White	745
Mapping urban open space and the compact city – research methodology.....	751
Tomasz Bradecki	751
Mark Changes for Sustainable Development through National Urban Information System (NUIS)	755
Sandeep Kumar Raut, Jay B. Kshirsagar	755
Mehrwert Region für Wärme und Strom aus erneuerbaren Energien.....	757
Dagmar Everding.....	757
New Belgrade – between yesterday and tomorrow	765
Lidija Jovanovic Nenadovic	765
New residential areas in Bucharest Metropolitan Area – location, type and characteristics	767
Maria Patroescu, Mihai Nita, Cristian Ioja, Gabriel Vanau	767
OpenStreetMap.org - Community game or real geo-data? And the role of data donations.....	773
Wolfgang W. Wasserburger	773
Participation of citizens as potential endusers in the innovation process for assistive technologies	779
Walter Hlauschek, Wolfgang L. Zagler, Paul Panek	779
Participatory planning for urban regeneration – the Polish experience	785
Piotr Lorens	785
Rebranding Lagos through Regeneration	787
Wale Fadare, Leke Oduwaye.....	787
Re-engineering of planning process with emphasis on foresight approach	799
Mohamad Reza Puormohammadi, Karim Hosainzade Dalir, Nader Zali	799
Smart Cities/Smart People – Guiding – Ideas	809
Manuel Da Costa Lobo	809
Smart technologies for cultural landscape and sustainable development.....	819
Agata Lo Tauro.....	819
Socially Sustainable Development: Planning Empowerment Among the Bedouin in Israel.....	825
Avinoam Meir	825
Some Problems with modern Management and Planning Systems: The technology-environment trade-off for the aviation industry.....	835
Philip Kimmel	835
Strategien integrativer stadtreionaler Entwicklung unter Wachstums- und Schrumpfungsbedingungen	837
Isolde Roch; Haiqiao Tan	837
Strategies and good practice for sustainable and liveable cities of tomorrow	853
Isabela Velázquez, Carlos Verdager, Ernst Lung, Uwe Schubert, Franz Skala	853
SUME – Sustainable Urban Metabolism for Europe.....	861
Barbara Bory, Christof Schremmer	861
Sustainable development at the city-region level: a broad analysis of the Porto Metropolitan Area	867
Nuno Quental.....	867

Terrorist Threat: Human Factor	869
Vasily Popovich, Manfred Schrenk, Vasily Osipov, Filipp Galyano	869
The City Planning Cadastre System of Moscow as a tool for sustainable urban development.....	885
Sergey Melnichenko; Konstantin Kuaznetsov.....	885
The ecological footprint – indicator for analyzing the environmental impact of residential surfaces in metropolitan area. Case study: Bucharest Metropolitan Area	887
Maria Patroescu, Mihai Nita, Cristian Ioja, Gabriel Vanau.....	887
The green-cover network for sustainable environment – case study of Chennai city.....	893
Meenatchi Sundaram.....	893
The importance of active public communication - Settlement systems and land use patterns seen from a disaster perspective	895
Christoph Aubrecht, Mario Köstl, Markus Knoflacher, Klaus Steinnocher	895
The Libraries of Serbia on their Way to the City 3.0	901
Vesna Župan	901
The New Emscher Valley – Reshaping an urban Landscape creates regional Identity	907
Frank Bothmann, Sabine Auer	907
Transition regions: green innovation and economic development	911
Philip Cooke.....	911
Ubiquitous Eco-City Planning in Korea. A Project for the Realization of Ecological City Planning and Ubiquitous Network Society	925
Yeon Mee Kim, Hyun Soo Kim, Soo Young Moon, So-Yeon Bae.....	925
Urban and natural transformations of agricultural lands in Moscow oblast.....	931
Boris Feldman, Alexander Antonov, Tatyana Antonova.....	931
Urban Design Process Model with “The Urban User” Participation.....	939
Tolga Uzun, Altay Çolak, Ayberk Nuri Berkman, Erkan Güneş.....	939
Urban development and planning in Iran	951
Ebrahim Jamshidzadeh.....	951
Urban Planning and Health - Obesogenic environments	953
Paula Santana, Rita Santos, Claudia Costa.....	953
Urban Sustainability Concept of Conservation Strategies in Turkey	955
Derya Altunbaş.....	955
Urbanisation and the incidence of urban heat island implications for climate change and global warming	959
Oluwafemi Ayodeji	959
Use of GIS in ecological resource sections of the scheme of spatial planning.....	967
Badmaeva Tatiana	967
Water City	969
Matthew Bradbury	969
Ways2go – R&D funding program as an instrument to stimulate mobility technologies for the cities of the future	971
Walter Wasner.....	971
Belize Caribbean Riviera - sustainable resort of the future.....	975
Alexander Piletsky, Carlos Chanduvi-Suarez, Mikhail Moshnogorskiy, Manfred Schrenk.....	975
Das Innovationsprogramm der Stadt Schwechat: Von der Verkehrsdrehscheibe zur Wissensdrehscheibe	985
Franz Kucharowits, Manfred Merten, Helmut Paugger, Manfred Schrenk	985

The New Urban Acupuncture: Intermodal Nodes between Theory and Practice

Aleksandra Stupar, Vladimir Savcic

(Ass. Prof. Dr Aleksandra Stupar, Faculty of Architecture, University of Belgrade, Bulevar kralja Aleksandra 73/2, 11000 Belgrade, stupar@afrodita.rcub.bg.ac.yu)

(Vladimir Savcic, MSc, Universitat Politecnica de Catalunya,

Departament de Projectes Arquitectonics, Av. Diagonal 649, 08028 Barcelona, savco_arh@yahoo.com)

1 ABSTRACT

The intermodal nodes, as important interchange areas of contemporary cities, represent one of the most vibrant and challenging elements of the current urban transformations. Frequently considered as initiators or generators of further urban and regional connectivity, accessibility and development, they are excellent experimental polygons for new planning strategies. Thus, the intermodal areas, originally perceived as marginal zones and used as the basic transportation support, upgrade their mono-functional background introducing the globally recognizable set of activities.

The main idea of this process is to create an improved urban system, based upon latest technologies and proclaimed imperatives of urban efficiency, competitiveness and sustainability. Therefore, the purpose of this paper is to present and analyze context, content and implications of intermodality and the transformations caused by this concept. Obviously, the structural, social and economic interchange have been achieved in numerous cases, but a total integration, real sustainability and an acceptable mode of applied technology still have to be confirmed in the future.

2 INTRODUCTION

The urban world of the 21st century is composed of numerous nodes, streams and webs, which create a new landscape of globalization and impose different logic of space and time perception. Therefore, the urban infrastructure is updated, its networks are continuously multiplied and various spaces of (inter)connections are folded in trendy architectural envelopes.

Following the general idea of higher efficiency, the global movement of flows shapes a different configuration which, nowadays, connects new urban focuses: airport/highway/railway – parking place/subway station – office/apartment buildings. Evidently, the introduction of new urban/global infrastructure systems is a necessity, but their harmonization with the inherited urban context has to fulfill the needs of all consumers. The higher urban connectivity, which could be attained by numerous traffic and information systems, enables the communication on every spatial level and scale. As a result, the systems of public transportation, systems of business/tourist flows and systems for information interchange (telecommunication networks) open the numerous possibilities for urban integration.

Usually, the first step of the global initiation is creation of new city gates (airports, railway buildings) and establishment of economic and information contact zones. They become the main connection points between different kinds of communication and transform themselves into the complex mega-structures, as the most vital organs of global cities. Their organization and form transmit numerous messages, glorifying the power of modern technologies, expressing the national dignity, reflecting the importance of a city in the world hierarchy or representing the symbols of a new urban regeneration. However, all these nodes function on several scales – integrating various activities, actors and spaces, and promoting the concept of intermodality.

3 THE IDEA AND ROLE OF INTERMODALITY

The idea of intermodality derives its logic from the complex traffic systems and represents one of the main pivots of the contemporary planning practice. Generating an impressive architectural program, it directs design and organization of sensitive urban areas playing an important role in modern cities. However, this term is frequently related to the traffic nodes – terminals, even though it could be embedded and/or applied in various categories of urban systems and on different levels and scales of design process.

In general, intermodality is a characteristic of a transport system which combines/uses at least two different transportation modes. These modes should be integrated, increasing the passenger mobility in a door-to-door transport chain. One of the main goals of modern intermodal passenger transport is to boost use of public transportation and to reduce the reliance on the private cars. At the same time, it should respond to numerous

(and often contradictory) demands in order to enable social and economic development, environmental protection, efficiency, safety and security, accessibility and – the freedom of mobility for any citizen.

Unfortunately, even though the concept of intermodality reflects numerous interactions, which exist in a dynamic contemporary urban system, it sometimes collides with environmental requirements or only declaratively accepts demands and recommendations given by local communities, experts or authorities. However, the basic principles of intermodality could be used as an active tool for urban planning and design, which could synchronize an inherited city space, multiplied needs and scales, as well as the latest technological achievements.

4 THEMES AND CHALLENGES

On our way to the improved passenger transport, there are numerous obstacles. According to the Eurostat data (EU-27, 2006) 72.7% of Europeans prefer to use their cars for everyday activities and in the new member states these figures look even more discouraging. Furthermore, various modes of transport (especially private car travel) represent the major consumers of non-renewable energy, which has a negative impact both on local and global level. Therefore, the concept of intermodal transportation was proposed by the European Commission as an alternative to the previous condition and as a possibility for a seamless travel which comprises all modes of transport, new technologies, a reliable knowledge base and well-balanced management. In spite of obvious benefits, which include all-inclusive, cheaper, comfortable, greener and safer travels, it is still necessary to coordinate local, regional and global level. As a result, it would be possible to unify standardization, regulation, ticketing schemes, booking and services across Europe and to emphasize qualities of intermodal networking.

The European Union initiated a number of programs and projects focused on various aspects of intermodal passengers travel in Europe. Obviously, this concept has been prioritized and documents such as the White Paper of the European Commission (“European transport policy for 2010: time to decide”, 2001) or studies (for ex. “Towards passenger intermodality in the EU”, 2004) certainly support and alleviate its implementation. Additionally, it is important to emphasize programs – for example, the funding program Marco Polo (2007-2013), which should encourage shifting of freight transport from the roads to rail, sea and inland waterways, or comprehensive projects like KITE – “A Knowledge Base for Intermodal Passenger Travel in Europe” (2007-2009), which should provide all relevant existing (and future) information and data about passengers intermodality.

One of the very interesting projects is LINK – The European Forum on Intermodal Passenger Travel, also funded by the European Commission (2007), within the 6th Framework Program. The main aim of the Forum is to provide “a platform for exchange, knowledge transfer and the promotion of intermodal solutions” but it also brings together all stakeholders and enables communication between main actors – authorities, associations, operators, users and industry representatives. In addition, the LINK forum presents various case studies, a virtual library and an intermodality glossary which further stimulates knowledge/practice exchange and promotes the idea of intermodal travel.

All these initiatives cover a wide range of themes dealing with different scales and spatial levels, modes of transport, aspects and methodology/tools but it is still early to estimate the real effect of all these impulses. However, one fact cannot be denied – the contemporary city space is changing and the guidelines outlined by the main principles of intermodality will represent a backbone of future urban transformations. Consequently, the intermodal nodes and their networks will become the unavoidable acupuncture points and meridians on a modern urban tissue – influencing our mode and quality of life.

5 INTERMODAL NODES – CHARACTERISTICS

The contemporary intermodal nodes could be classified according to various criteria:

- importance for local, regional and global connectivity
- position in a metropolitan/urban networking
- spatial structure
- functional structure
- mode(s) of transportation

- applied technology
- level of planned/achieved sustainability
- level of integration

In general, intermodal nodes with their traffic networks, complementary activities and surrounding (service) zones could represent:

- local connectors (networking on a metropolitan scale, local service center)
- regional connectors (intersection of several regional transportation networks, inter-metropolitan links, service center on a regional level)
- global connectors (the main intermodal hub of major regional networks, interregional/global service center).

Considering the position and role in a metropolitan intermodal system, it is possible to distinguish two basic types of networking – with hierarchical structure (various levels of importance) or without it (all nodes/elements have equal importance), but frequently these two types are combined. Therefore, intermodal node could represent the main intermodal metropolitan unit, an integral unit of the main intermodal zone, a unit of intermodal network (the same level of importance) or a unit of a merged intermodal metropolitan system (various levels of importance) – Figure 1.

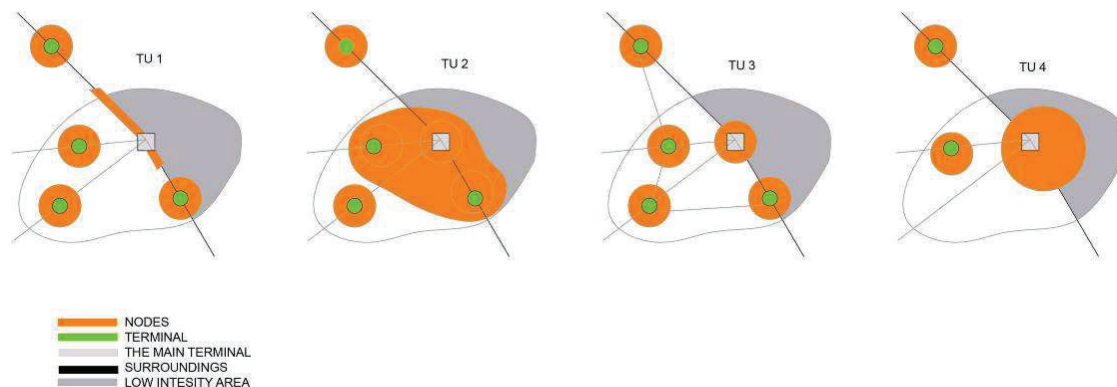


Fig.1. Intermodal nodes/units in the intermodal system of metropolitan networking.

The intermodal nodes have a specific spatial structure shaped by their elaborated program and numerous demands – functional, technological, environmental and socio-economic. The main areas are:

1. Passenger area

- entrance zone
- corridors (linear, circular and mixed systems)
- leisure area /restaurants, shopping, etc./ – circular, linear and network
- platforms and technical support

2. Border area – architectural envelope

This area directly and indirectly shapes the urban environment and its identity defining a level of its urban integration and directing its spatial perception (Fig. 2).

3. Public area – interchange and intermodal spaces and processes

- transit areas (linear, circular, mixed)
- retention-crossing areas
- concentration points
- connectors

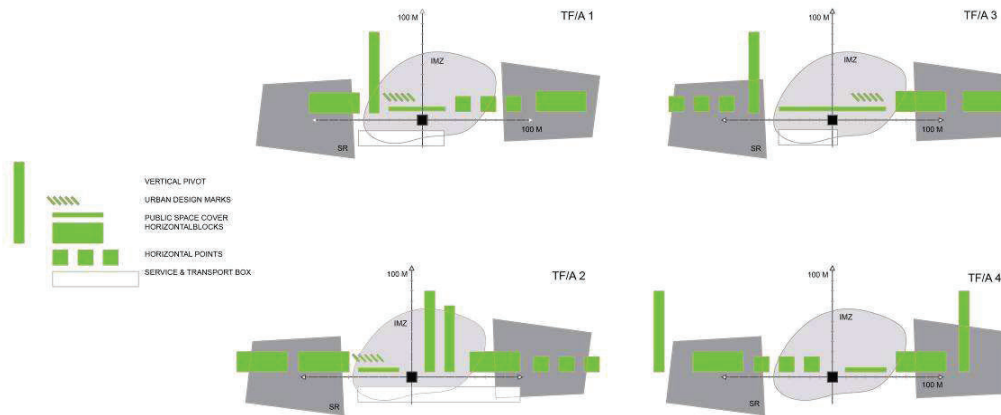


Fig. 2. Modes of spatial perception

The functional structure of intermodal nodes could also be quite diverse, but it usually comprises all the important urban activities stimulated by the globalization process (Fig. 3). However, their distribution could vary – influencing the layout, architectural composition, inter-/intra- urban connections, as well as directing the future urban transformation of a surrounding area.

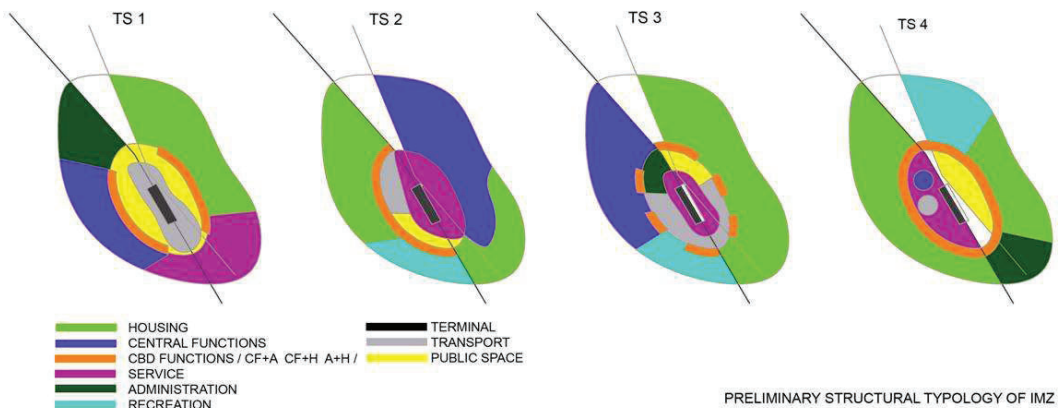


Fig. 3. The functional structure of intermodal nodes – variations.

Since all intermodal nodes combine different types and levels of transportation, it is also necessary to achieve a high level of coordination, efficiency and safety. Therefore, the advanced technological solutions have to be incorporated and applied on several levels, scales and issues:

- planning and design process (methodology and tools – impact analyses, models, scenarios, decision-making, evaluation, monitoring)
- awareness (how, where, when to travel)
- management
- accessibility/movement – people (all groups and categories), vehicles, goods
- e-services (payment, information, survey, GPS)
- new materials and structural systems
- recycling

Evidently, the modern technology has a crucial role in the concept of intermodality because it provides a necessary foundation and support for various activities – from the urban development, land use, taxation and regulation, to the intelligent transport systems and environmental protection.

The intermodal nodes, with their numerous effects on built environment, development/transformation and urban life, obviously represent hypersensitive centres whose excitation or inhibition could cause a number of side effects. For example, urban acupuncture could be conducted in three different ways – as a:

- re-integration (interpolation, controlled transformation, adjustment to the existing urban environment)
- new contextualisation (negation of previous urban condition, redefinition of inherited urban identity, modelling of new landmarks)
- regeneration (structural changes directed by globalization trends, (re)creation of selected themes, areas and focal points).

However, the results of these interventions, as well as their chain-reaction(s) cannot be completely controlled or foreseen. The concept of intermodality, positioned in a contemporary framework, still has to be fully developed and implemented.

6 FROM THEORY TO PRACTICE

The contemporary intermodal nodes integrate separate transport systems and complementary activities, but they also present a new image of our globalized society. The examples of Zentralbahnhof in Berlin, Euralille (Lille) and Sagrera station (Barcelona) clearly reveal this logic, as well as new demands related to attractiveness, spatial and functional comfort.

The main train station in Berlin, Zentralbahnhof represents one of the largest cross-modal train stations in Europe which connects national and international trains, city trains and subway lines. Its position in the centre of the city supports its role as the main mobility hub of Berlin, which connects east and west, north and south. Furthermore, the station is the main terminal of a specific mushroom railway system, which was introduced after 1989 in order to enable transport reunification of the city. The system is nowadays controlled from a central terminal and its supporting units which supervise regional and city lines.

The complex of the two-level terminal covers approximately 70 000 m² (15 000 m² for commercial and restaurant area) which consists of an arched supporting structure and two massive perpendicular structures. The intermodal zone is surrounded by a residential zone (west), university campus (south-east), port terminal (north) and commercial zone (west), which makes the whole area highly defragmented and heterogeneous. Therefore, it is questionable to what extent this multimodal and intermodal node really represents an urban ‘connector’. In spite of its transportation role, implemented technology, monumental scale, variety of spaces, activities and – symbolism, it still represents an urban division and an infrastructural necessity which is not integrated on all levels and scales.

Obviously, the urban acupuncture has stimulated regional and international flows, but it has definitely inhibited fragile networks which should have been established in the urban environment.



Fig. 4 – Berlin, Zentralbahnhof (2006) – an intermodal node which connects various transport networks but disconnects delicate links in urban fabric.

Euralille intermodal terminal was built in 1994, as an important connection node of the European transport networks (UK, The Netherlands, Belgium, France). Designed for the last generation of high-speed trains it also includes a new commercial district and represents an interesting intermodal and architectural area. Although a result of local interests and governmental decision, this collage of buildings designed by famous architects (Koolhaas, Nouvel, de Portzamparc, etc.) has provided a crossing-point for national, regional and

international lines, which consists of two terminals, commercial center, exhibition space and several public areas. Euralille terminal is organized as a three-level longitudinal platform, but it also follows the tradition of the nineteenth-century terminals. The intermodal ring has a questionable balance of closed and open spaces, while the whole complex has hard borders – towards the urban nucleus (north-east) and the commercial downtown (west), and the soft ones – residential zone and a park area (south). However, in spite of some weaknesses related to its spatial indetermination, Euralille has become an interesting example of a contemporary intermodal spatial area, with a noticeable vibrancy and a specific identity.



Fig. 5. Euralille, Lille (1994) – an intermodal node or a trendy architectural experiment?

Sagrera HST terminal in Barcelona, will be a new central terminal based upon the concept of intemodality. It should enable integration of high speed train system (AVE), existing and new city train lines (RENFE), buses and the Metro, which should all together increase a flow of passengers and transport efficiency. In fact, this node should connect the city to the development axis in Spain and in the rest of Europe. The station will have three subterranean levels and a street level in order to link different transportation modes i.e. levels of integration. However, this node should also connect neighborhoods of La Sagrera and La Verneda, as well as provide connections with the ring-road of Ronda del Mig and some access routes to the city.

The development impulse which this acupunctural multimodal node emits should also effect the transformation of the surrounding area, introducing a set of tertiary activities. Furthermore, a development of a 3.5 km long linear park above one of the main rail lines is planned, which should minimize negative environmental impacts.

Apparently, Sagrera HST station should achieve total connectivity and accessibility on all levels – from local, metropolitan to regional and international. However, we should wait for its completion in order to evaluate its real intermodal and urban qualities and its role in the further development and transformation of this area.



Fig. 6. Sagrera HST Station, Barcelona – a new node of local/metropolitan/regional connectivity. Success or failure?

7 CONCLUSION

The contemporary city generates numerous networks which should increase its total connectivity, facilitate multiscale accessibility and provide time and space contraction. Following the demands of globalization, the concept of intermodality, with its multiplying nodes and webs, represents just one of the tools which should

enable all these aims. Supported by the advanced technology which pervades all areas of our lives, intermodality is about to become one of the global imperatives but its real potential still has to be released and applied.

In the meantime, various planning experiments transform the urban tissue – exciting or inhibiting selected spatial fragments and creating a new landscape which is simultaneously connected and disconnected. Nowadays, everything should be characterized as ‘all-inclusive’, ‘comprehensive’, ‘smart’, ‘intelligent’, ‘friendly’ and preferably with prefixes ‘multi-’, ‘inter-’ or ‘intra-’. Unfortunately, reality frequently clashes with these idealized visions, leaving behind remains of unsuccessful decisions and exaggerated expectations. Therefore, we should be careful with the concept of intermodality, too.

After all, intermodality should not be considered just as an aim, but as an instrument which should improve – and not destroy, all urban values that we have had through centuries.

8 REFERENCES

- ABRUZZO, Emily, DUVAL, Alex: 306090 08: Shifting Infrastructures. NY, USA; 2004.
 BLOW, J. Christopher: Transport Terminals and Modal Interchange: Planning and Design. London, 2005.
 BUSQUETS, Joan: Barcelona- The Urban Evolution of a Compact City. Harvard; 2005.
 CLEMENTI, Alberto: Infrastrutture e Piani Urbanistici. Pescara, 1996.
 DITTMOR, Hank, OHLAND, Gloria: The New Transit Town: Best Practices in Transit-oriented Development. London, 2005.
 KOOLHAAS, Rem and Harvard Design School: Mutations. Bordeaux, 2002.
 KOOLHAAS, Rem: La ciudad generica. Barcelona; 2006.
 MVRDV/ MAAS, Winy: Five Minutes City. Rotterdam, 2002
 PAWLEY, Martin: Terminal Architecture. London, 1999.
 RAMDERT, Francis, APEL-MULLER, Mireille: Architecture on the Move, Cities and Mobilities. Barcelona, 2003.
<http://www.linkforum.eu/index.phtml?ID1=984> [6. 2. 2009]