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##### Track 3: “Sustainable city, Urban Vulnerability, Urban Mobility”

##### Coordinators: Atilla Baskurt (UdL/IMU), Sandrine Lebigre (UdL/IMU),

##### Manoel Rodrigues Alves (USP)



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**Smart cities, smart environment**

New challenging problems have steamed from sustainability issues in smart cities. Indeed, smart cities and buildings are equipped with sensors monitoring many different physical conditions (such as temperature, sound or traffic speed). These sensor networks generate huge data flows, which must be collected, analyzed and efficiently exploited to optimize resource consumption and, more generally, drive sustainable economic growth for citizens.

In this context, examples of challenging problems are:

* Declarative approaches for indexing, querying and mining time-dependent Data: As sensor networks often deal with various kinds of sensors and middlewares, we need to design new declarative approaches for specifying needs at a high abstraction level, independently from technical details.
* Real-world scalability: A sensor network is usually composed of many sensors, and each sensor takes a lot of measures during a day. As an example, the conurbation of Lyon aims at estimating travel times every 6 minutes on more than 50,000 links in its road network. Therefore, we need to define new approaches able to deal with real- world size problems.
* Stochastic and dynamic optimization: Sensored Data may be leveraged to obtain time- dependent mean predicted data. However, in many real-world applications, we search not only for good solutions with respect to mean predicted data, but also for robust ones with respect to distribution probabilities. Also, it may happen that real- time conditions monitored by sensors are significantly different from the predictions. Therefore, we should develop new optimization tools able to deal with stochastic and dynamic optimization.

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**Christine Solnon.** Christine Solnon is professor of computer Science at INSA de Lyon. She is member of the LIRIS lab and she works on constrained optimization and constraint programming. She is also member of the IMU (Intelligence des Mondes Urbains) LabEx where she leads, together with Sylvie Servigne and Sylvie Barraud, a research topic on "Environment, nature and eco-technologies".

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**Economic, social, environmental indicators**

The notion of sustainable development has been shaped in the 1980s to make the environmental agenda enter traditional programs dedicated to economic development and social equity. We consider « Sustainable City – Urban Vulnerabilty – Urban Mobilities » research program as a way to follow up with this perspective and to evaluate, more than 30 years later, what came up with sustainable development policies in the urban sector. Can we observe, at first, a complementarity of the three constituent parts of the sustainable development?

Governing by numbers seems at stake today, at every level of government. Especially in urban policy making, where urban policies are evaluated today through a range of quality and efficiency indicators. That’s the reason why urban indicators development offers a useful point of view to wonder how sustainable development’s agenda transformed public policies.

How is managed the gathering between old social indicators and new environmental ones? Were new environmental indicators really integrated? Or have they been simply added next to others, without any guaranty to be taken in account? More broadly, such questions lead to wonder about quantification policies. How sustainable development quantifications are formulated and implemented? For whom? For what projects? It should contribute, for example, to determine whether indicators are used for programming or legitimation issues.

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**Fabrice Bardet**.Fabrice Bardet hold a PhD in political science at Paris 1 La Sorbonne. He recently defended his tenure thesis in which he suggests to develop a field in quantification policy analysis (whether statistical or accounting quantification). In his view, we’re facing what he calls an "accounting counter-revolution": after what historians of science established as a "probabilistic revolution" that occurred between 1800 and 1930 and that led to an avalanche of statistical measures, we now have to consider the spread of new quantitative tools of government, most often based on accounting technics (rankings, benchmarking, commensurations…). He developed his program in the sector of planning and public works: development policies, transportation policies, social housing, green building…

Main perspectives : the accounting counter-revolution, quantifying sustainability, globalization and urban policies

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**MCMV Social Housing and Urban Poverty in Brazil: social indicators of urban vulnerability and urban mobility**

The purpose of this communication is to discuss the Minha Casa Minha Vida Policy - the main Brazilian social housing program, specially the version called Entidades. This program has paradoxical consequences: meanwhile it allows the access to a house to poor families, it makes difficult or impossible the access to the urban life and services. This policy led to the abandonment of all other policies or programs of social housing in Brazil. Among its consequences, this policy has changed social and popular organizations, born from housing social movements, into partners of Brazilian State and building houses machines in the distant bounderies of metropolitan areas. The aim of this communication is to point out that this policy´s housing developments apparently fighting against poverty, undertake the dimensions of sustainability, mobility, producing or reproducing urban and social vulnerable conditions, and induces new and old forms of apartheid and segregation of low-income urban population.

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**Cibele Saliba Rizek**. Graduated (bachelor) in Social Sciences (University of São Paulo) in 1972;  master in social sciences, PhD (sociology – University of São Paulo) in 1994, associate professor in the Institute of Architecture and Urbanism of the University of São Paulo;  member of the NAPUrb (Support Center for Research)   Urbanization and globalization (University of São Paulo) and senior researcher at the Center for the Study of Citizenship Rights. She organized several books like The Age of Uncertainty (A Era da Indeterminação), Hegemony  and its Averse (Hegemonia às Avessas), and  Emergency Exits: win and lose the own lives on the outskirts of São Paulo (Saídas de Emergência: ganhar/perder a vida na periferia de São Paulo);  coordinator of  research project on Brazilian politics of social housing  MCMV Entidades: uma abordagem etnográfica;   CNPq ( National Council of Technological and Scientific Development) researcher since 1999.

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**Sustainable City: environmental, political and social issues**

“Sustainable City” is a recurrent theme, always present in academic research. However, the approach is mostlly technical, not politcal. LabHab understands that the environmental question, and its relationships with housing and urbanism, in order to provide instruments to social justice, implies a major reform in the political, land tennance and urban structures of our society. The presentation will address theoretical aspects of LabHab research related to two works in progress: one related to alternatives for urban drainage system in risk situations; the other, investigates mandatory remotions in environmental fragile areas, many times due to urban interventions.

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**João Sette Whitaker Ferreira.** João Sette Whitaker Ferreira is architect and urbanist, graduated by the University of São Paulo (1990), and economist, graduated by PUC/SP (1993). He got a Master’s degree in Political Science, investigating the globalization thematic, and a Doctorate’s degree in Urbanism. His doctoral thesis, “São Paulo: the myth of the global city”, that discusses the role of ideology on the production of urban space, was appraised in the IX Brazilian Award “Urban and Regional Policy and Planning” as the best doctoral thesis, granted by ANPUR – the National Association of Research and Graduate Programs in Urban and Regional Planning – in 2005. He is Associate Professor in Urban Planning at the Architecture and Urban Planning Faculty of the University of São Paulo, and coordinator of the LabHab – the Laboratory of Housing and Human Settlements of FAU/USP. He is also a consultant in urban planning, housing policies and urban development, including for the Federal Ministry of the Cities, and author of ‘The myth of Global Cities’ (2007) and “Producing Houses or building cities? The challenges of a new Brazil urban” (2012). Visiting Professor at Sorbonne Nouvelle-UNiversité Paris 3 – Institut de Hautes ètudes sur l´Amérique Latine – IHEAL, from 09/2011 to 02/2012.

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**Assessment of urban vulnerability to different types of hazards**

Risk management, historically based on the control of hazards, is moving towards an attempt to reduce the vulnerability of human, environmental and materials issues. For this purpose, the goal of this research project is to study the vulnerability of two urban centers, Lyon and São Paulo, to get an accurate and operational vision of the risks of these areas, which can be directly used by actors and local officials. Thus, it is necessary to identify and prioritize the human, environmental and material issues of these two cities, then to estimate the level of strategic priority of each from the local actors, and finally to assess the sensitivity of these issues facing various hazards that may affect their integrity, such as flooding, landslides or the transport and the storage of hazardous materials (Renard, 2010).

Strategic priority and vulnerability issues will be evaluated through the analytic hierarchy process (AHP - Saaty, 1994), based on semi-structured interviews with local stakeholders. The results will be processed by GIS using a uniform square mesh to overcome the diversity of size and shape of the administrative boundaries of cities. A clustering method (Bourdeau-Lepage and Tovar, 2013) will be used to identify areas of greater or lesser vulnerability to various hazards.

For each city, a map of overall vulnerability will be produced, associated with a mapping of strategic areas. Vulnerability maps will be superimposed on existing hazard maps to provide an overview of risk. It will also be possible to produce vulnerability maps based on the type of issues considered.

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**Florent Renard.**

Since 2011: Lecturer: Geography and Country planning – University Jean Moulin Lyon 3 (France)

Chair: Environmental impacts - CNRS UMR 5600 Environment City Society – University Lyon 3

Ph.D. in Geography “The rainfall risk in urban areas: from the characterization of the hazard to the assessment of vulnerability” (2006 – 2010)

2010 – 2011: Research and teaching Fellow – University of Grenoble 1 (France)

2008 – 2010: Head of Mission at the Metropolitan area of Lyon, Water Department (Greater Lyon)

2007 – 2008: Research and teaching Fellow – University of Poitiers (France)

**Didier Soto.**

Since 2013: Post-Doctoral Fellow – CRGA UMR 5600. Université Lyon 3 (France).

2012: Phd in Geography “Geographical analysis of the Northern Atlantic continental climate changes during the Weichselian Late-Glacial”.

2008-2009: Research and Teaching Fellow – Université d’Avignon et des Pays du Vaucluse (France).

Key words: territorial vulnerability, risks, Geographical Information System, climate change, geography.

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**Urban risks**

**Hazards in the recharge areas of the Guarani Aquifer in the state of São Paulo**

The studies aim to better characterizing the behavior of the infiltration water into recharge areas of the Guarani Aquifer in the state of São Paulo and the possible influence of areas of diffuse pollution (agriculture) and concentrated pollution (urban and industrial waste). They are also interested in the study of natural materials for the protection of the environment and the recovery of degraded mining areas. Three main actions:

1. Zone of the Guarani Aquifer recharge: The studies aim to better characterize the behavior of the infiltration of water in recharge areas and the possible influence of areas of diffuse pollution (agriculture) and concentrated pollution (deposits of urban and industrial waste).
2. The recovery of degraded mining areas: Provide technical recovery of contaminated areas and recovery of waste and characterization of residual clay soils of the Vale do Ribeira. Characterization of residual clay soils of the Ribeira Valley and analysis the retention properties of inorganic pollutants (metals from potentially toxic waste) to allow their use in sealing barriers.
3. Using natural materials to protect the environment and minimize impacts: Checking whether or not the mobility of the metals from sequential extraction tests and physicochemical parameters of environment. Assess the variability of these materials and the retention properties of inorganic pollutants, allowing its use in sealing barriers compacted.

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**Essaid Bilal**.Essaid Bilal is Director of Research in Ecole Nationale Supérieure des Mines de Saint-Etienne (ENSAM-SE); Doctor in Geochemistry of Ecole Nationale Supérieure des Mines de Paris (France) and Doctor Honoris Causa from the University of Bucharest. His action in sustainable development is articulated around three axes: metrology and expertise; development of clean processes and recycling industrial waste. He have a great experience of international cooperation, especially in the scientific field, whether academic exchange programs and research programs and industrial development. Since 1985, he has much collaboration with Brazilian universities, he was associate Professor of at the Federal University of Minas Gerais (UFMG) and Associate researcher at Centro de Desenvolvimento da Tecnologia Nuclear (CDTN), Campus of UFMG, Belo Horizonte and much collaboration with UnB, UFRRJ and Poli and IG of USP. His scientific competence is recognized at national and international level (162 publications and 147 communications), several industrials research contracts under his belt, and the supervision of numerous doctoral students. He is, since 1992, associate member CNRS UMR 6425, now member of UMR EVS. He is member of the Scientific Committee and editorial of several journals and organizations and expert from the European Community programs, expert with the European Agency Education France European training programs: Leonardo da Vinci, Erasmus, Erasmus Mundus and technology transfer. He has an important economic and scientific network of relationships in France and in several countries.

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**Urban Mobility and Equity**

The study of urban mobility helps to think about a more equitable city, in which differences are not expressed as inequalities. For that, it must to consider the contemporary processes of urban space restructuring: 1. more complex urban structures that combine logical center-peripheral to others 2. increasing on consumption of goods and services, and reduction on the access to property and to ownership of parcels of urban space; 3. continuating the logical of urban planning supported by the idea of ​​zoning, with a growing need for mobility; 4. redefinition of spatial practices, according to economic and spatial conditions more selective.

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**Maria Encarnação Beltrão Sposito.** Bachelor in Geografia - at Universidade Estadual Paulista Júlio de Mesquita Filho, Presidente Prudente (1977), master in Geografia at Universidade Estadual Paulista Júlio de Mesquita Filho, Rio Claro (1984) and PhD in Geography at Universidade de São Paulo (1991). Post Doctor in Geography at Université de Paris I – Sorbonne (1994-1996). Work at Universidade Estadual Paulista Júlio de Mesquita Filho, Presidente Prudente. Has experience in Geography, focusing on Urban Geography, acting on the following subjects: production of urban space, middle cities, urban structure and urban centrality. Coordinator of the Network of Researchers on Middle Cities (ReCiMe). Actual research: Contemporary economic logicals and spatial practices: middle cities and consumption.

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**City and Sustainability: urban environment and urban space production**

In the context of the production of contemporary urban space, the debate between urbanism and sustainable city deals with new socio-spatial urban morphologies, as well as with environmental questions of urbanization processes. Any debate about city and sustainability has practical consequences and modifies socio-spatial conditions of the urban environment and, therefore, should aim at the development (resignification) of its theorethical framework. Encompassing a broader spectrum of analysis the research assumes the specialization of urban space and its central importance in the modern world. The questions addressed argue that economical, social and political aspects must be taken into account to promote the notion of a sustainable urban space representative of a cooperative co-dwelling model for the urban environment.

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**Manoel Rodrigues Alves** (Manoel Antonio Lopes Rodrigues Alves)**.**Architect and urbanist graduated by the University of São Paulo; Master Degree in Architectural Science at MIT; Doctoral degree in Urbanism at USP. Professor of Urban Design at IAU-USP. Former pos-doctoral degree and Visiting Professor at Universidad de Seville, Escuela Técnica Superior de Arquitectura. Academic and research exchange with ETSA-US (Spain), LNEC (Portugal) and FADU-UNL (Argentina)..Leader of research groups LEAUC – Laboratory of Studies for the Contemporary Urban Environment and NAPUrb – Research Support Center on Urbanization and Mundialization. Research focus on contemporary city and public space.

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**Sustainable City, Urban Vulnerability and Urban Mobility: a possible approach**

The city – a concept and a reality - is an interdisciplinary theme with explanatory power for understanding the modern world through the way we produce and plan urban space (and hence where we live). This three themes, articulated, indicates a problem of spatial order: the understanding of the urban in theory and in practice, as a) sustainability, taken as a product of a process that during its performing destroyed nature, creating an ecological crisis; b) the vulnerability as the product of the selection process in the valorization of urban land; and c) mobility seen through the differential access of individuals to the city. Together, these themes summarize the conflicts experienced. The existing ways of understanding these themes points out different actions and proposals. A technical intervention or a social change? The spatial justice and the right to the city gain centrality in the analysis.

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**Ana Fani Alessandri Carlos.** Titular Professor of Geography, Geography Department, Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo. Bachelor, Master and Doctoral degrees at FFLCH-USP. Pos-doc degrees: Universitè de Paris VII (1989); Universitè de Paris I (1994).  CNPq ( National Council of Technological and Scientific Development) researcher. Member of the NAPUrb (Support Center for Research)   Urbanization and globalization (University of São Paulo) and senior researcher at GESP-USP. She has published and organized several books: “Espaço-tempo na Metrópole” (Jabuti Prize Honorable Mention, Social Sciences, 2002); “O Espaço Urbano: novos escritos sobre a cidade”; “ A Condição Espacial”; “São Paulo 450 anos: as geografias da metrópole” (co-editor Ariovaldo Oliveira); “Urbanização e Mundialização: estudos sobre a metrópole” and “ Barcelona e São Paulo cara a cara: processos metropolitanos a la hora de la globalización” (co-editor Charles Carreras). International Academic and Research Agreements Coordinator CAPES / MECD and CAPES / COFECUB. Member of the research net “La Somme et le Rest”.

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**Urban verticality**

Our project combines collaborative and comparative approaches to investigate the political, economic and social issues arising from the conceptualization of the urban third dimension: verticality. This new focus has emerged from the increasingly high numbers of skyscrapers being built in cities across the world but has not been studied in a comprehensive way with cross-disciplinary approaches bridging humanities and engineering. With Lyon and London, Sao Paulo with its established high-rise building tradition, would be relevant case study.

The project aims at filling the existing “conceptual gap” on the contribution of tall buildings to:

* the social and economic dynamics of contemporary metropolises in the age of globalisation and diverging economic evolutions (i.e. the rapid growth of Brazil and the maturation of European economies)
* the sustainable city, from the regulation of mobilities to the design of buildings and inclusive public spaces in the face of increasing privatization and control
* the contested design of the urban landscape (skyline) and its political regulation
* the urban environment (heat, air and water circulation, local climate change…)

The research project would include contributions from geographers, urbanists, architects, sociologists, economists, historians, anthropologists and engineers.

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**Manuel Appert.** Associate professor of urban geography and planning, Works on metropolization patterns and dynamics, first through the lense of coordination of transport and land use planning and then, more recently, on the diffusion of skyscrapers in European cities and their impacts on public spaces, transports, and the wider environment.

**Christian Montès.** Professor urban geography, has also first developed an expertise in transport planning in metropolitan areas. Since then he has widen the scope of his researches dealing with landscape planning and design of public spaces in North American cities. He is now working on the regulation of skyscrapers in the heritage cities.

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**Geohistorical approach of urban development**

**Promoting sustainability through diachronic urban cartography**

Sustainability cannot be achieved without a precise knowledge of the occurring phenomena. This implies the study of the processes which led to the nowadays city configurations and materiality’s as well as acquiring knowledge of the processes affecting today’s urban space. The studies we propose are the continuation of ongoing research programs in the field of urban historical transformation at UMR 5600. These programs concern space consumption (at the scales of metropolis, urbanization units and buildings), the making of urban landscapes and question the heritage conservation policies. These analyses are built on an in-depth understanding of the urban fabric. In partnership with the planning agencies of Greater Lyon and St-Etienne, and with administrative bureaus at Lyon and Strasbourg, the usefulness of these programs is now well established and makes new ways of dealing with urbanization processes possible. For example, conservation perimeters or thermal insulation of older buildings can be confronted with spatial analysis. As such, this approach has asserted its economical and cultural spin-offs. The exchange with Brazilian colleagues implies a new heuristic approach based on the comparison of two large cities: Brazil’s largest developing metropolitan area and France’s second metropolitan area.

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**Enali Maria (Leca) DE BIAGGI**.Junior Researcher and Teacher at the Geography and Spatial Panning Department - Université Jean Moulin Lyon 3, Coordinator to the masters degree« Geo-marketing, geographical intelligence and decision making » since 2004

Research themes:

• Spatial analysis and representation in spatial planning: geographical intelligence and decision making

• Integrating cartographic representation to research projects: risk management, health geography, and territorial justice.

• Historic cartography and spatio-temporal- analysis : building data banks to explore territorial dynamics on urban development

• Spatial humanities and Historical GIS

**Bernard Gauthier**. University Professor, Geographer Université Jean-Moulin Lyon 3 / Research Unit : CNRS UMR 5600 Environnement, Ville, Société

UMR 5600, Environnement, Ville, Société, co responsible ot field C « Building of Environments».

Member of Labex Intelligence des Mondes Urbains (IMU)

Lyon 3 director of Ecole Doctorale ED 483 social sciences.

Main research projects :

• Project Territoire et patrimoine (Territory and Heritage), direction, financed by Région Rhône-Alpes. 2006-2010.

• Project Du Stade de Domitien à la place Navone. Genèse d'un quartier urbain (From the Domitian’s Stadium to Piazza Navona, genesis of an urban quarter), searcher and scientific advisor, Ecole française de Rome, 2007-2011. Study of the urban and architectural transformation of a part of Rome from the late 15th century to the 19th.

• Member of the redaction board Histoire et mesure (History and Measure, Paris).

• Foreign Correspondant of Città e storia (Citty and History, Rome)

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**Innovative Adaption Actions Towards Resilience of Water Resources**

To integrate crosscutting issues of vulnerability to water hazards, we discuss a feasible range of engineering opportunities on adaptation strategies to cope with risks derived from either climate variability and disaster management. Through some ongoing interdisciplinary examples, we present yardsticks on participatory actions towards water resilient mechanisms. Examples are extracted from four research groups: (1) Interdisciplinary Climate Investigation Center (INCLINE/USP), (2) Disaster Education & Research Center (CEPED/USP), (3) Adaptation Strategies To Reduce Vulnerability and Impacts from Climate Change in Brazil (FAPESP-IVA, coordinated by INPE) and (4) Sustainable Urban Drainage (FINEP-MAPLU). Preliminary experiences gained help on shaping new thematic projects through international partnerships through innovative adaptation actions towards resilience of water resources.

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**Eduardo Mario Mendiondo** (born 1968). Water Resources Engineer from Universidad Nacional Del Litoral, ARGENTINA, with Master of Science and PhD of Civil Engineering and Water Resources from Universidade Federal do Rio Grande do Sul, BRAZIL. Former Post-doc and Senior Researcher at Center for Environmental Systems Research of University of Kassel, GERMANY. Invited fellow of UNESCO, and Flood Forecasting Initiative of the World Meteorological Organisation. Academic & research exchange with Univ. Arizona (USA), Texas A&M (USA), Univ. Kassel (Germany), Kyoto Univ. (Japan), UNESCO-IHE (The Netherlands), Ecole des Mines d’Alès (France). Assistent Professor of University of Sao Paulo at Sao Carlos School of Engineering. Leader of research groups of Brazilian Research Council (CNPq). Nowadays coordinates associated projects of water vulnerability, impacts and adaptations under interdisciplinary task-groups of: (1) FAPESP-Thematic Project of Assessment of Impacts and Vulnerability to Climate Change in Brazil & Strategies for Adaptation Options, (2) the INter-disciplinary CLimate INvEstigation Center (INCLINE-USP), and with (3) the Disaster Research and Education Center (CEPED-USP).

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**The Definition of Functional Urban Regions (FUR) and its Relationships with Transportation Infrastructure**

A basic condition to functional urban regions (FUR) is the existence of a efficient communication between neighbor municipalities. Consequently, transportation infrastructure plays a major role in this process. The definition of such regions in Brazil is usually based on quantitative methods that do not represent the real relationships between the municipalities within the FUR. Therefore, spatial based methods such as spatial statistics and spatial modeling, applied to land use and transportation infrastructure indicators have been used to define and monitor FUR.

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**Gustavo Garcia Manzato.** Civil Engineer graduated at São Paulo State University (UNESP) in 2004, obtained a Masters degree in Transportation Engineering in the field of Planning and Operation of Transportation Systems at the School of Engineering of São Carlos - University of São Paulo in 2007 and a Ph.D. degree in Transportation Engineering in the area of ​​Decision Support Systems applied to urban planning and transportation at the Eindhoven University of Technology - Netherlands in 2012. Has experience in the area of ​​Transportation Engineering, acting on the following topics: GIS, spatial analysis, spatial statistics, spatial modeling, econometric modeling.