University Alliance for Sustainability

# Final Report: Senior Stay at Freie Universität Berlin

Dr. Nikolai Bobylev

Saint Petersburg State University

## A Sustainable Compact City: investigation on comparative economics and land use data in dense urban environments

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Keywords: Environmental management, Environmental Planning, Ecosystem services, Green Infrastructure, Water, Resource management, Urban Physical Infrastructure, Urbanization

This research stay was a continuation of a fruitful co-operation established during a teaching project on Sustainable Urbanization & Comparative Development, which was led by Prof. Theocharis Grigoriadis and Dr. Nikolai Bobylev via Freie Universität Berlin – Saint Petersburg State University Joint Seed Money Funding Scheme. This project was running in 2017 and involved lecturing exchange, Dr. Nikolai Bobylev has delivered lecture on Global Environmental Change and by Prof. Theocharis Grigoriadis on Urban Economics. The senior research stay 2018 included some teaching seminars, research, and preparation of a funding application.

The research activities stem from a global urbanization challenge and the experience and interest of Dr. Nikolai Bobylev in an urban sustainability, physical infrastructure, and land use indicators. One of the Dr. Bobylev's recent publications discussed Urban underground space use and laid out indicator framework for its consideration in the urban sustainable development (Bobylev, N, [2016] Underground Space as an Urban Indicator: Measuring Use of Subsurface. Tunnelling and Underground Space Technology). While considering a compact three-dimensional city and its urban underground space use from a standpoint of environmental rationality, feasibility concerns arise as to how this can be implemented in diverse cities. A Compact city is an urban development concept, outlining an ideal city where resources are used most efficiently.

During the research stay at FU Prof. Theocharis Grigoriadis and Dr. Nikolai Bobylev discussed an economics component to a compact three dimensional city research in terms of land use, densities, and infrastructure. Specifically we have been exploring urban underground space and its development in a compact city, and an economic basis for this. The main research question we were

working on is which economics factors, data, or indicators can be relevant to judging on feasibility of a compact city development, and its urban underground space in particular. Underground space is vital in achieving density and environmental quality, but to which extend can it be economically feasible? The question to a certain extend pertains to a perceived tradeoff between environmental and economic components of sustainability.

During the course of the stay Dr. Nikolai Bobylev gave a lecture at a seminar on Russian Environmental Policy, the lecture was focused on UN Global Goals and implementing them in a Compact City.

**New projects:**

Winter School Public Policy and Sustainable Development, 27 February – 04 March 2019, Astana, Kazakhstan. This initiative pending approval by Volkswagen foundation is quite topical and would advance international efforts to establish academic and professional multilateral co-operation in the field of Sustainable Development. Prof. Theocharis Grigoriadis, Prof. Kirill V. Chistyakov, and Dr. Nikolai Bobylev, are among interdisciplinary and international team of scientists who will take part in the School.

**Related publications:**


1. Bobylev N (2018) Geosystem and Ecosystem Services – Exploring Opportunities for Inclusion in Urban Underground Space Planning. Proceedings of the 16th World Conference of Associated research Centers for the Urban Underground Space. Integrated Underground Solutions for Compact Metropolitan Cities. 5-7 November 2018, Hong-Kong, China. http://www.acuus2018.hk/Scientific%20Committee.html
2. Bobylev N (2016) Transitions to a High Density Urban Underground Space, Procedia Engineering, Volume 165, 2016, Pages 184-192, ISSN 1877-7058, http://dx.doi.org/10.1016/j.proeng.2016.11.750.
3. Zargarian R, Hunt DVL, Braithwaite P, Bobylev N, Rogers CDF (2016) A new sustainability framework for urban underground space. Proceedings of the Institution of Civil Engineers - Engineering Sustainability. ISSN 1478-4629 | E-ISSN 1751-7680 DOI: http://dx.doi.org/10.1680/jensu.15.00013
4. Bobylev, N (2016) Underground Space as an Urban Indicator: Measuring Use of Subsurface. Tunnelling and Underground Space Technology, Elsevier. Volume 55, Special Issue: Urban Underground Space: A Growing Imperative. Perspectives and Current Research in Planning

and Design for Underground Space Use. ISSN: 0886-7798. Pages 40 – 52.
http://dx.doi.org/10.1016/j.tust.2016.02.022