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City in Transition: How to Plan Riga in 21st Century

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1 ABSTRACT

It is clear that the social-economic and political reality of the 21st century has undermined most of all the expectations from the current (2006-2018) planning vision of the city of Riga, the capital city of Latvia and the largest historical and economic canter of the Baltic States. It is time to restart the necessary instruments (evaluating the current state, defining goals and needs of interested parties, developing planning tools and supplementary documents – like visions, normative acts, data bases, etc.) in order to be "well-prepared" in planning, as well as in preserving the most important values of Riga (such as the number of residents, infrastructure, cultural sites and buildings) for the next 12 years (2018-2030).[9] [10]

The modern thinking for spatial planning strategies is based on principles of urban intelligence and on the development of the new concept of smart cities, in which the integration between contemporary reality and the historical city becomes an important factor and were urban "smartness" has been also reached through historic (cultural) elements within "the virtual world" of ICTs.[19]

This paper will discuss the most important aspects (problems and possible solutions) in the planning of the most internationally well-known part of Riga - Riga's Historical Center and its protective zone (HCR and its PZ), which is also a UNESCO World Heritage Site [11], noted for its architectural qualities – outstanding urban space, Art Nouveau and 19th century wooden architecture. [15] [20]

The paper will also note what kind of modern instruments would be necessary (still not efficiently used) for the planning process of the most internationally well-known part of Riga (Riga's Historical Centre and its protective zone) smart (more and more uses of ICT tools for creation, updating and publication of spatial planning related information).

2 ACTUALITY AND METHODOLOGY OF THE STYDY

The capital city of Latvia, Riga, currently is facing a new challenge - how to develop a new city development plan in a sustainable (smart) manner, which would satisfy all of the "in-planning" interested parties (entrepreneurs, international investors, tourist, institutions and citizens) and would solve the most urgent , typical for most European metropolises and addressed to urban design problems (like de-urbanization, polarized economic growth, increased pollution, transferring brownfields into greenfields, maintenance of historical sites and buildings, insufficient funding for fulfillment of public needs etc.).

One of the major challenges for contemporary urban planning is the growing complexity and holism of planning function. In planning practice the broadly used pragmatic approach has been examined to adapt traditional planning instruments to new requirements - smart planning (the use of the ICT progress in the planning process and discussion). ICT progress has changed the manner of planning, involving more and more technologies (particularly geographic information systems (GIS) solutions) for the maintenance, publishing and updating of environmental spatial and descriptive data, as well as social-economic data. [8] [19]

Many cities world-wide are searching for a way to turn their planning strategies into reality and want to know how suggested smart solutions for planning can help to fulfill their expectations for transforming their cities into „smart cities". "smart sustainable cities" or „smart historical cities". [1] [19]

Riga is amongst those metropolises that would comply with the criteria to be „a smart historical city" in the future due to outstanding historical values and current GIS developments. It has been emphasized by international organizations (e.g. the UN, the European Commission) that cultural heritage is the fundamental aspect of people's identity in modern society and must be transferred to the next generations in the best possible condition and way.

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Also the land administration paradigm, to which urban design is addressed, has changed: alongside the three classical dimensions (economic, environmental, and social), it nowadays also includes "good governance" and "the culture", requiring a systemic approach, a balancing of interests, more public involvement (bottom-up planning) and classified environment related data. [31]

Therefore one of the most unique sites of urban design in Latvia and in North-Eastern Europe - the RHC and its PZ have been selected as the object of this study, answering the following questions:

- What makes an historical city „smart" and what kind of recommendations exist for planning an historical city in a smart manner?
- What kind of problems does the HCR and its PZ particularly face that must be solved using spatial planning instruments?
- What kind of solutions would be developed (introduced) for the planning of historical part of Riga in sustainable (smart) manner?

The theoretical framework of study is based on an analysis of earlier international and local research of theoretical principles of smart cities, modern spatial planning methods and cultural heritage protection. Analysis of Latvian spatial planning regulation, freely available data from public registers and open source platforms, as well as the surveys of resident's satisfaction has been used. This analysis is a part of initial results of the on-going study „Prospective for Maintenance of Residential Function in the HCR and its PZ" (2014-2015).

The following research methods (approaches) will be applied: the empirical approach (for the analysis of theoretical sources of the concept of values, property valuation and spatial planning); quantitative research (for studying and the processing of social-economic statistics, property market data, surveys of satisfaction of residents and spatial planning information). Spatial analysis using Arc Map 9.3 will be applied for depicting the physical location (e.g. borders) of the HCR, its PZ and Old Riga (downtown) on the cadastral map (background material), permitted land use (residential buildings) and the distribution of residents by building in the HCR and its PZ.

3 WHAT MAKE CITY SUSTAINABLE AND SMART?

The term "smart city" is still quite „a fuzzy concept" and has been applied in ways that are not always consistent. [1] There are numerous definitions and criteria exist world-wide for the characterizing of smart cities. In most of the cases, one important "umbrella" element has been dominant: the efficient use of ICT progress (particularly in running traditional spatial planning GIS solutions) as a key instrument to enhance numerous functions of cities and their well-being (high quality of life by excelling in multiple key areas: economy, mobility, environment, people, living, and government) with the purpose of reducing resource consumption and effectively and actively engage with their citizens. [1] [15]

However there are also other definitions (or criteria) for smart cities that exist globally, putting ahead other aspects or national priorities instead of the dominant use of technologies in the functioning of the cities (e.g. social and cultural elements, wise management of natural resources, "life-knowledge" based development, safety and prosperity, development of traditional communication infrastructure, involvement of citizens in city governance, increasing the of quality of life, employment, education opportunities, occupational skills and income level). [12] [30]

The term „sustainable city" (or "eco-city") considers the environmental impact of human activities and is dedicated to minimizing required inputs of resources (energy, water, food and raw-materials; pollution) []

There is no complete consensus for a paradigm for what components should be included in „sustainable city". [21] Generally, planning experts agree that a sustainable city should meet the needs of the present without sacrificing the ability of future generations to meet their own needs. [15] [30] [31]

It is estimated that over 50% of the world's population now lives in urban areas. The mobility of people is high world-wide. Because of this, a shift to more dense, urban living would provide more opportunities for social interaction and material prosperity.[12]

Contrary to common stereotypes, urban systems very often can be more environmentally sustainable than rural or suburban territories due to more control and interest in regional and local planning. [14] [21]

During the past decade international organizations (e.g. the UN and the European Union (EU)) have devoted constant efforts to developing strategies and criteria for achieving “smart' urban growth for metropolitan city regions. The European Commission (EC) in particular in its spatial development and environment protection related documents describing “smart urban growth” uses such terms like “an information society”, “digital content”, “semantic information”, “smart infrastructure”, encouraging and promoting the use of ICT solutions in the governance of cities. [13] [19]

The EU defined the basic framework of smart cities for the European Community that consists of six basic elements where ICT plays an important role in data sharing, support for decision making support, producing big data and developing stakeholder platforms and tools for better promoting public policies and better funding of the development needs of cities (e.g. EU funding). (See Fig 1)

Fig. 1: The framework of a smart city (EU requirements) [19]

The EC Smart Cities Stakeholders Platform (2013) emphasizes the need for implementation of the Integrated Action Plans (IAP) for smart cities based on common principles for setting the baseline for benchmarking studies, standardized information for assessment of indexes (internally and externally available) and common standards (particularly use of ISO standards) for granting of the status and monitoring the functioning of sustainable smart cities. IAP for sustainable smar cities consists of a long term vision (which would be clarified by short term objectives) and long and short term strategies. [19]

The governance of the cities is very complex. Cities in their daily life face the challenge of simultaneously combining competitiveness and sustainable urban development [8]. Success depends on their capacity in decision making, as well as solving local conflicts linked to a wide variety of actors and the implementation of modern knowledge (ICT and e-services).[8]

Smart spatial planning provides a vision for successful urban operation and ensures that people and territories can connect in the present and future.

Five key success principles have been identified for sustainable smart cities: 1) Sharing the vision; 2) Effective governance; 3) Long-term political commitment; 4) Strong links with land-use planning and economic development; 5) Long-term funding commitment.[19]

The development of IAP should be based on a clear structured process that takes into consideration multiple factors and regular studies: 1) Studies of best practices and policy examples of the cities; 2) Analysis of cities components (including utilities, real estate, transportation, city services); 3) Estimation of the indexes of cities; 4) Setting of cities objectives (social, economic, environmental). [19] [26]

Digital technologies can collect and process sufficiently large amounts of actual and historical data that are used in the operation of cities (particularly in spatial planning). The new ICT potential from sensors on buildings, roads and other components of urban space and the sharing and integration of this data between service delivery channels will enable the improvement of data services, monitor and control resource usage and react to real-time information. This data has also been used for public discussions (involving society in development of spatial vision and local territorial planning [8].

In practice the level of implementation of the governance of smart cities varies between countries. For example, Great Britain has developed a national strategy for smart cities with the specific recommendations for different planning levels and states. Among the most „smart” cities are Barcelona, Stockholm, Chicago and Boston. However the levels of „smartness” of those cities vary and depend on common level of ICT

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development, policies for public registers, and the level of access and use of Internet and development priorities. Many of them (e.g. U.S. and Canadian cities) are developing their own „smart action plans" (e.g. San Francisco and New York setting their transportation and environmental policies within their jurisdiction) or the use of technical tools for the making of cities „smarter" (e.g. the increasing dominant habit of people to use smart phones for local communication and using numerous public services – public parking, paying bills, use of infrastructure, etc.).

4 WHAT DOES IT MEAN TO BE A SMART SUSTAINABLE CULTURAL CITY?

The culture of sustainability is a new inter-disciplinary approach, whose purpose is to increase the significance of culture and cultural space in sustainable development planning. Sustainably shall be measured through both cultural policy setting and science. [12]

Culture as an element is also integrated into the modern land administration paradigm.[31] However more initiatives from national countries are still necessary to transform these recommendations, knowledge and information into practical, well-operating heritage protection systems.[8]

Culture probably is the most important and complex aspect for promoting the sustainable development of cities and refers to ethics - how people understand and appreciate nature, resources, common values (also planning culture) and each other. [12] [29] Ignoring ethical aspects can have a profound impact on long-term development. Intangible or invisible (e.g. identity, local and international recognition, aesthetic, values, beliefs) and tangible or visible (social groups, institutional framework, corporate, technologies, tangible culture, e.g. inherited built environment) elements of culture create cultural space. [12]

The most representative reference document that guides local governments in how to elaborate on their cultural policies is "Agenda 21 for culture". Agenda is based on traditional principles of cultural diversity, human rights, as well as on intercultural dialogue, participatory democracy, sustainability and peace. [1]

5 INITIATIVES FOR CULTURAL HERITAGE SPHERE

The use of the ICT progress also helps us to innovate architectural heritage conservation strategies to allow safe, sustainable and effective action in the context of the smart management of a city and common context of planning methodology.[1] [8] [15]

European cultural heritage also has a high economic potential. [27] The EU represents a significant demand for culture: 39% of respondents (from EU 27) have indicated that culture is very important in their lives, associating it with the performance and visual arts and architectural heritage.[13]

In the EU direct and indirect activities with cultural heritage produced an income of almost 350 billion euros and ensured 9 million work places (2013). Turnover of conservation activities is about 5 billion euros yearly. The potential of conservation activities remains high: more than 25% of all buildings in Europe were built prior to 1940 and need care. Another challenge (also chance for many industries) for ensuring sustainability is the adjustment of heritage buildings to the requirements of energy efficiency and environmental accessibility.

The ongoing COST Action initiative "Investigating Cultural Sustainability" (2011-2015, http://www.culturalsustainability.eu/DuxburyCOST14.11.2013.pdf) is aiming to increase understanding of the place of culture in people's lives and sustainable development via multidisciplinary approaches [1], but ethical living, education and innovation shall be considered to be the essential means for the required common cultural environmental change.

The advancements of ICT lead to more and more use of Linked Open Data (OLD) providing for innovation also in the heritage sphere and its related services. It has been estimated that nowadays over 80% of all data has a spatial component or dimension, but people worldwide prefer to use spatial (image) data instead of texts and figures. The number of smart phones users is growing and people use apps. [2] [7]

Particulary interest in architecture promotes international tourism and this data can promote developmet of new e-services, data application for education, tourism and businesses for SME. [2]

EU project SDI4Apps (2014-2016; http://sdi4apps.eu/) focuses on the use of geographic information in education and supports creativity, technical capabilities, skills, knowledge and relations, through online sharing of spatial based content for the environment, history and culture of different local and European

regions beyond linguistic barriers (which are one of the most significant constraints for the communication between different regions). [13]

Other example is Arches (Heritage Inventory & Management System) project (http://archesproject.org/). Arches is an innovative open source software system that incorporates international standards and is built to inventory and help manage all types of immovable cultural heritage. This initiative brings together a growing worldwide community of heritage professionals and ICT specialists. This portal offers freely available information to download, customize, and independently implement.

Information on cultural heritage becomes more and more accessible due to culture and environment related data digitization and integration initiatives.

UNESCO (the most recognizable authority in heritage protection) lunched its World Heritage Site (website: http://whc.unesco.org/en/list), which is an interactive website addressing places that are listed by UNESCO as of special cultural or physical significance and having digital content and cultural monuments in danger.

UNESCO contributes to projects and places of culture and scientific significance, such as: Masterpieces of the Oral and Intangible Heritage of Humanity; Memory of the World International Register and World Heritage Sites. These activities have aggregated the world's best knowledge, practices and recommendations from 196 member countries. [24] [29]

Despite information digitization and integration initiatives, large amounts of cultural heritage related information (especially regarding architectural heritage) are still not digitized, classified (standardized), summarized (estimated common stock) and integrated in open access information systems..

6 EUROPEAN CONTEXT FOR SPATIAL PLANNING

In 2009 Latvia has started the development of it SDI with the purpose to implement requirements of the INSPIRE directive and its implementation rules in numerous areas: metadata, data specifications, network services and technologies; licenses on data sharing, access and use; and coordination and monitoring mechanisms, processes and procedures established, operated or made available in accordance with the INSPIRE requirements.[2]

The concept included geodesy and cartography at its essence its development. [3]

The INSPIRE Directive has been adapted in Latvia’s legislation by the adoption of the Spatial Planning System Development Concept (2009) and the passage of the Geospatial Information Act in 2009. [8]

Simultaneously several Latvia’s public authorities had started to develop their mutually integrated, important for spatial planning, GIS systems (e.g. “Development of the State Land Service’s Geospatial Data Geospatial Information System” (SLS GIS), "Information System for Administration and Supervision of Territorial Development Planning of Local Governments, Infrastructure and Immovable Properties” (TDPIS), Building Data Information System (BIS)) using funding from the European Regional Development Fund for the purpose of complying with the European environmental policies (e.g. requirements of the INSPIRE directive) and promote the use and sharing of spatial data. [2]

The most important system for spatial planning is the TDPIS (https://ivis.eps.gov.lv/IVISPortal/files/folders/tapis/default.aspx), which aims to create a modern, GIS based system for transparent spatial planning information storage, processing and sharing, territorial development and real estate and infrastructure management for the entire territory of Latvia in lieu of the current, autonomous, unconnected with actual property information planning systems of local municipalities. [14] TDPIS will contain all of Latvia’s planning systems: national, regional, municipal plans, detail plans, local plans, functional zonings, and all documentation on planning initiatives, activities and normative regulation.

It is estimated that TDPIS will be fully introduced into practical operation in 2015-2016. However, one module of the TDPIS infrastructure - “The Regional Development Indicator Module” (RAIM) (http://raim.gov.lv/pub/#/) was launched in 2014. The initial purpose of RAIM is the provision of social-economic data and statistics accessibility and processing for local territorial plans.

Other projects – The SLS GIS (cadastre, addresses, property values) and the BIS (building data and documentation) is also needed for spatial planning and will be integrated into TDPIS.

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Within the implementation of INSPIRE, numerous European and local public and private initiatives developed open standards based spatial data sets. “Big data” owners (mostly state agencies) very slowly open their data bases for free [are very slowly making their data bases available for free???]. It makes planning activities difficult (particularly efficient public involvement) and the development of new data platforms and e-services. However new e-services (also royalty free) have been introduced into property data registration and use (e.g. Cadastre, Land Register, Enterprise Register, and Municipality of Riga). The best examples of open data platforms are Zemgales Region Geoportal (geoportal of Zemgales planning region authority), Koceni Municipality, topografija.lv (topographic data), e-skola (education), grausti.lv (deserted buildings of Riga’s municipality).

The Riga City Council operates its GIS system “RIGIS”, which helps support the planning and function of the city. “RIGIS” is publicly available and as background materials uses an unupdated (year old) cadastral map [vai maps] and available ortho-photo maps. RIGIS it is not fully integrated with other planning related databases and does not ensure efficient support and monitor of such complex (holistic) function as is the case for planning. [20]

7 LATVIAN NATIONAL VISION FOR SPATIAL PLANNING

The Concept of Territorial Development Planning (2009) identified that the most important problems of the current planning system are a lack of common data standards, a lack of a classification system for depicting current land use in territorial planning cartography and uniform planning principles, poor digital content for spatial information and non-integrated and out-of-date spatial planning related data systems. It has emerged that the identified problems must be solved prior to the introduction of the national SDI. Several planning documents, laws, by-laws were adapted: e.g. “Sustainable Development Strategy of Latvia until 2030” (Latvia2030), Spatial Development Planning Law (common spatial planning process); Construction Law (new building regulation), General Regulations for the Planning, Use and Building of the Territory (land use standardization). [26]

Strategy Latvia2030 in principle differed from earlier ones. It was developed using the EU requirements for sustainable development and for the first time in Latvia promotion of the use of Internet as the most important skill for any person for realization such strategic principles as creativity, tolerance, cooperation and participation (involvement in bottom-up governance) was made a priority. [26]

Latvia2030 shall be implemented through seven interactive actions: 1) Investment in human capital; 2) Change in paradigm of education; 3) Innovative and eco-efficient economy; 4) Nature as a Future Capital; 5) Perspective of Spatial Development; 6) Innovative Governance and Participation of Society; 7) Development of Cultural Space. The main policy areas will be: accessibility and mobility, the polycentric structure of settlement and the development of spaces of national interest (e.g. Riga agglomeration, Baltic Sea coastal area and Eastern border area). [26]

Latvia2030 also required development of long term spatial visions for five planning regions and established as the priority the promotion of development of open data sets also in the public sector, public e-services and the improvement of geomatic skills of civil society and small and medium sice enterprises (SME).

8 THE BUILDING OF THE NEW CONCEPT FOR A PLANNING VISION FOR RIGA

In 2014 the Riga City Council adopted the new Sustainable Development Strategy for Riga until 2030 and the Development Program of Riga (2014-2020). [9] [26]

The development of the “next generation” spatial plan for Riga (2018-2030) shall be based on a completely new approach for planning (defining the baseline for future monitoring of the planning process, performing benchmarking and preliminary comprehensive research, ensuring a continuous cooperative planning method and use more transparent, “image-based”, planning manner), taking into account the new spatial development strategy and legislation (e.g. new land use classification), as well as use of required standardized GIS tools in the planning process, data publishing and sharing (compliance with the criteria to be a “smart” city).

The planning process of the new spatial plan for Riga will be introduced in four phases: research and development of the methodology for planning, benchmarking and development of 11 thematic plans (2013-

2014), development of the 1st draft (2015), the approval process for the original document (the decision of the Riga City Council), (2016-2017) and implementation and use (from 2018 to 2030), (see Fig. 2).

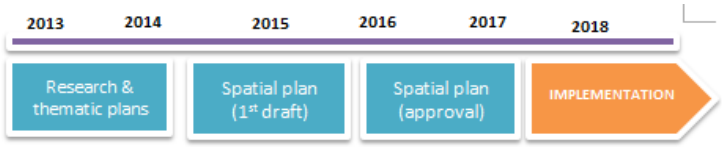

Fig. 2: The planning process of the new spatial plan for Riga [9] [26]

The new main goals for the spatial planning of Riga will be:

- To provide solid regulatory and proactive function of land use planning to ensure proper legal ground for the regulation of land use and construction processes, as well as for use in application of cooperative planning method in the process of planning;

- To establish a system for the Riga municipality that provides a continuous "multi-stage" planning process and monitoring (holistic cooperation, cooperative planning, digital, semantic content, integration spatial data with statistical module, as well as to ensure future integration of planning documentation in the TDPIS);
- To ensure "bottom-up planning" - maximum transparency of planning, explaining planning objectives, tasks and processes by which they are achieved to the civil society: the private and public sector (e.g. maintenance of website and interactive communication);
- To build a compromise between the various parties involved in the development of the city (e.g. to advocate the interests of those who are not able to participate in discussion);
- To move the process of spatial planning closer to the general public of Riga (e.g. transparent monitoring of urban land use changes);
- To develop a program for thematic planning (for 11 thematic plans, e.g. for cultural monuments and housing);
- To create "a strong and well-founded" planning concept for Riga (provide sufficient information for setting a baseline and for development of a 1st draft for functional zoning);
- To create knowledge about planning and scenarios as to how urban sustainability can be reached (to research the best practices and model it on the case of Riga), (See Fig. 3). [9] [26]

Fig. 3: The framework of building of the spatial plan for Riga (2018-2030) [9] [26]

A cooperative planning method will be used during all of the planning process until the approval:

- Input of "in planning interested persons" into establishing a correct vision and planning details and input of research tools (e.g. living labs);
- Data collection (e.g. from open data sources) for the support of planning with cartographic and descriptive information. [9]

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9 METHODOLOGY FOR STUDY

The theme of "cultural monuments" is one of the eleven important elements which will be integrated into the new digital content functional zoning for Riga and has been researched within the study „Prospective for Maintenance of Residential Function in the HCR and its PZ" (2014-2015). Criticisms to the current plan for Riga are mostly addressed to functional zoning, however international planning examples have shown that the scope of problem can be more complex and that the best solutions in comprehensive planning can be reached using a cooperative planning method.

The evaluation of prospective for maintaining residential function within the HCR and its PZ was performed using the following methodology:

- A survey of the requirements (regulation, trends, ICT trends and standards for information, demands for cultural monument protection, construction, environment impact evaluation, living standards, taxation, occupancy, etc.) for the modeling of culture dementia in a sustainable urban environment;
- Collection of data and the building of a semantic data base for performing comprehensive spatial and statistical analysis and for the setting of the baseline:
    - available data sets, background materials and data layers, e.g. Open Street map, RIGIS cadastral map and address points of the State Address Register (for the purpose of identifying the location of buildings in the cadastral map), ortho-photo map, spatial data from open source platforms, e.g. skolas.lv (education establishments), grausti.lv (location and addresses of deserted buildings and slams), etc.;
    - available socio-economic, demographic, cadastral, ownership and building permits statistics, classifications of land use, buildings, groups of premises and encumbrances (e.g. the status of a "cultural monument"), addresses, distribution of residents (Population Register), distribution of enterprises (Enterprise Register), building data, property market data, Census 2000 and 2011 data (from the data base of the Central Statistical Bureau), general social-economic trends (RAIM data), data from the surveys of citizens (2011, 2014, publicly available), etc. The initially built structure of the data base and required parameters in vector format are depicted in Fig. 4;
- Diagnosis of the state of implementation of current functional zoning (elaboration of data layers with current (2014) and permitted (2006) land use, identification of the changes and its impact characteristics (breakdown and volume of land use and ownership, volume of issued building permits, size of free area, portion of residential use, public space, etc.);
- Diagnosis of the socio-economic impact and demographic changes (2006-2014);
- Diagnosis of the satisfaction of residents (surveys from 2014 - this tools is being used for the first time for local planning needs);
- Diagnosis of property market trends (supply against demand) – the impact on residential function and scenarios for development (the use of statistics form Land Registry ans The State Land Service);
- Diagnosis of other factors (global, environmental, cultural, technological, political, etc.) that may be affecting residential function and the common development of the HCR and its PZ;
- Mapping of socio-economic and structural changes (the use of Arc Map 9.3 tools)
- Summarizing of the results of spatial and descriptive data analysis and the setting of the baseline parameters for future comprehensive planning (residential function);
- Identification and the grouping (classification) of the most important problems (its impact and importance on the common development of territory and possible solutions);
- The Drafting of the final report and the preparation of supplementary information ([a vai the] spatial and descriptive data base for the HCR and its PZ) for future integration into the common data base of spatial plan of Riga.

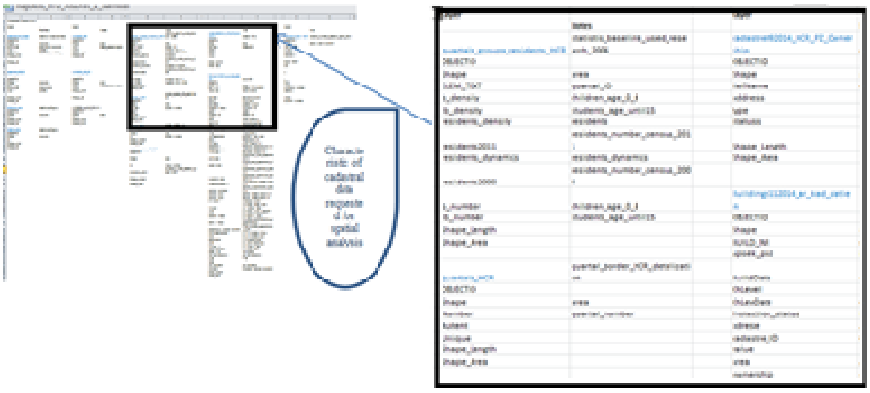

Fig. 4: The Initial structure of the data base and the required data

10 THE HISTORIC CENTER OF RIGA AND ITS PROTECTIVE ZONE

The city of Riga encomposses the HCR (mostly identified as a compact territory of Old Riga) and its PZ adjacent vicinities (mostly built prior 1940). The HCR is the unique World Heritage Site, listed in UNESCO's World Heritage List due to its outstanding composition of urban space, Art Nuveau and 19th century wooden architecture. HCR and its PZ occupy only 1.4% of 307 sq.km. of territory of Riga, encompassing in total about 62 000 (in 2011) inhabitants and 4000 buildings of various age, style and use (e.g. residential and commercial functions). [20] [22] [23]

More than 200 cultural monuments (forming a total of 8584 registered units in the entire country) of State and local significance (mostly buildings) are concentrated within the HCR, however other urban fabrics located in this area and its PZ also have outstanding architectural qualities and contribute to common design. More than 80% of buildings were built prior 1940; have depreciation in average 60%; 62 buildings have been recognized as "a degraded object of public space" (slam status). [16] Today large numbers of privately owned historical buildings (e.g. multi stores Art Nuveau buildings) are refurbished, well maintained and occupied (e.g. rented out for wide range tenants: local and international business, foreigners, etc.). These buildings represent the most prestique sector of real estate market, mostly are too expensive for local clients and sold out for foreigners from East Europe and Asia. Realtors do not prefer to invest in wooden (low-story) heritage buildings: they are difficult to maintain, expensive to remodel and have no option of demolishing the building or changing its physical size. [6] [18] Almost 50% from current residents live within the HCR less than 10 years; average size of household is less than 2 people. Almost 60% of respondents would move to suburb due to environmental reasons (e.g. air pollution, noise, unsafe place for children, lack of green areas, high crime, and poor parking abilities). [17]

Functional zoning (permitted land use plan) represents economic, potential (use) of land and structures located therein. Land use planning for the HCR and its PZ is well supported by solid normative regulation due to its status: the Master Plan of Riga (2006-2018), the Master Plan of HCR and Its PZ and supplementary by-law of Riga City Council. [4] The Master Plan of Riga and its supplementary documents contain a general framework (new construction, restoration, remodeling), allowed parameters for plots and buildings (size, volume, number of floors, height, sub-division, minimum plot, free area, proportions of public space and street, etc.), plans for permitted land use and protective zones and by-law regulation. The Master Plan of HCR and Its PZ, and the by-law of the Riga City Council has been applied alongside with general regulation of the Master Plan of Riga for the development of new plots, reconstruction and remodeling of current structures (e.g. size, parameters, distribution and use of area, used interior and exterior materials, interior and exterior architectural features), planning and organizing of public space (to ensure its historical qualities and promote its use). [4] [22]

Functional zoning (permitted land use plan) allows mixed land use in the entire HCR and its PZ to promote the diversity of perspective land use and in the remodeling of current structures, sets provisions (proportions in %) for public space, parking lots and street area. In mixed territories land and buildings (mainly multi stores) can be used for apartments, business, services, dwellings (in several territories low-stores buildings), allowing business and service spaces on the lower stores. The proportions of the various types of use vary in different locations and can be irregular for residential function: Central building territories with small

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proportions for dwellings (40% and less – it can vanish) and Central building territories with big proportions for dwellings (40% and more – will provide also high living standard), see Fig. 5. [4] [22] [23]

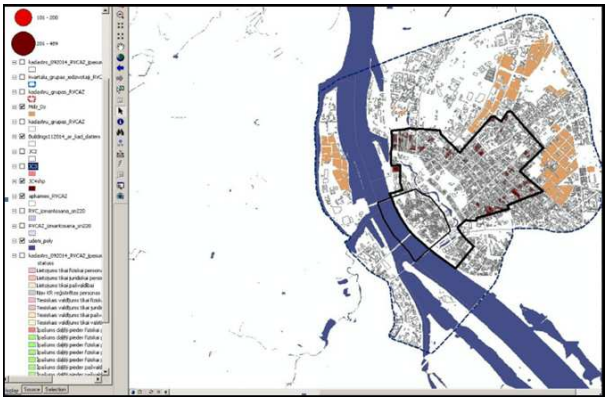

Fig. 5: Distribution of current use of land for residential purpose in the HCR. Background material – cadastral map (year 2014).

The breakdown of permitted use of territories (2006) has shown that approximately 20% from all building space can be used as residential; 2% of entire territory is used for green areas (probably contain existing parks and squares); 4% of territory is free (probably un-built plots or plots with poor construction), making difficult to develop new green areas and new construction (probably also rising demand and prices in vacant land. [22]

According to the Census, since 1989 the number of residents in the HCR has decreased by almost 40% (11790 in 1989; 70192 in 2000; 62 000 in 2012). However, the current distribution of residents in the HCR is regular in all locations, see Fig.6. [22] [25]

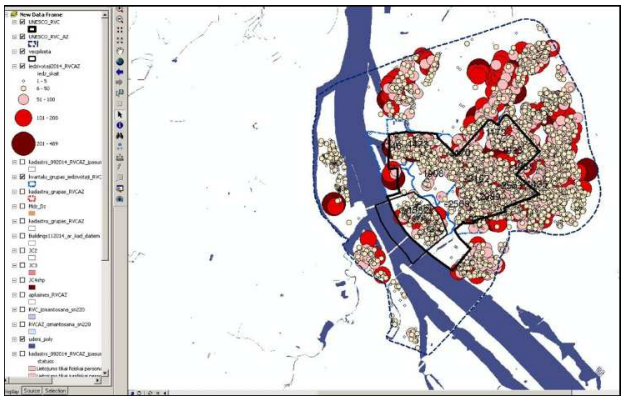

Fig. 6: Distribution of residents and its changes (2006 against 2011) in the HCR and its PZ. Statistical data source: The Office of Citizenship and Migration Affairs, Population Register (year 2014);Census 2011. Background material – cadastral map (year 2014).

11 IDENTIFIED PROBLEMS

All within stydy “Prospective for Maintenance of Residential Function in the HCR and its PZ” identified problems can be divided into the following five groups: global (common, social economic), technological, spatial planning (problems addressed urban design, public space and its infrastructure), political (institutional and systemic problems) and cultural (institutional and political (corporate) culture), see Table 1).

Depopulation, which has been emphasized as the most important problem addressed in the spatial design of the HCR and its PZ, has causes that are global and social economic - that cannot be addressed as a problem only particular to one area and cannot be solved by zoning regulation, the building code and the promotion of property market. It requires deeper analysis in regards to how it can be stopped and how planning function can promote it.

Current zoning documentation of the HCR and its PZ and its supplementary documentation contain all the required spatial and descriptive documentation in relation to the development of historical properties. Unfortunately this information is not well structured and integrated. Registers are no integrated making difficult this information use, understand, compare and publish.

Typical problems addressed in the planning and remodeling of historical buildings mostly relate to administrative burden (e.g. numerous procedures in the planning process, property data registration, etc.) and complicate the decision making process involving shared ownership rights, week financial aid and instruments for owners in renovating historical properties, etc. [8] [26]

Group	Specification of the problem	Couse	Solution/impact
Global (common, social economic)	Depopulation; Global (local) political and economic instability; Cultural differences (e.g. corporative culture and planning culture); Mobility of work and people; Change of living standards; [27] Change in personal values and preferences (technological impact); Unbalanced development of property markets (insufficient, adequate, residential market supply for local purchasers); [5] Insufficient purchasing power of residents; Limited alternative work options (e.g distance work); Internationalization of local market.	Global and national (local) social economic and political impact, its trends.	Global and national (local) social economic recovery, Common geopolitical stability.
Technological	CT impact on common (people and institution) manner use, consume, collect, update, exchange information; Change in manned of planning (application of GIS solutions).	Global ICT development trends, its implementation state in national (local) land administration.	Adaption of global ICT trends in national property data maintenance, exchange, update and publishing; The use of GIS solutions in planning.
Spatial planning problems (addressed urban design, public space and its infrastructure)	Unbalanced developments of territories (contrasts, empty buildings, irregularly developed infrastructure); Unbalanced supply and demand of residential space (e.g. in size, financially available for local clients); [27] Deserted buildings (high administrative burden in planning, construction, remodeling and removal); Insufficient social infrastructure (lack of places for kindergartens, parking options, playgrounds, parks); Insufficient "family friendly" open space (risk for children safety; lack of children's playgrounds); Pollution (poor air quality, noise); Unsafe public space (high crime risks, low trust in police).	Functional zoning in connection with local property market trends (demand/supply) and common (national) housing policy.	Monitoring of implementation of spatial regulation (GIS based solutions); Public involvements (the use of cooperative, bottom-up planning manner). The improvement of uses cartography materials.
Political (institutional and systemic problems)	Complicate (non-transparent) building condition (long planning phase, construction process, complicate building demolishing involving property data updating); Non-integrated, property data system (e.g. separate Land Register and Cadastre, limited amount of information about architectural heritage are available on-line (e.g. archive)); Complicate property rights (separate rights in land and buildings make difficult property transaction, investments, remodeling, etc.); Insufficient policies in support or the owner in cultural monuments maintenance and renovation (only 8% received state financial aid for renovation. Regulation of public procurement (lower price) limits attracting of ES funds for ensuring of energy efficiency of residential real estate in HCR); No tax reliefs exist for owners, who maintain, occupy, and invest in cultural residential property (less income tax, discounts for loans). Slowing housing policy (e.g. first residence for young families).	Current state of national land administration and real property policy.	Adjustment of land administration instruments (legislations) and its supportive system (institutions, registers and services) to current internal demand, as well as international trends.
Cultural (institutional and political (corporate) culture).	Low common public trust in institutions, politicians, as well as in spatial planning and construction process, property market activities , efficient use of public resources (collected taxes); Unfair social policy (access to social residence and distribution of financial support).	Common social economic environment regarding publicly, supported and shared values.	Changes in common value system (from political to individual).

Table 1: identified groups of problems affecting spatial planning in the HCR and its PZ (research of residential function and protection of heritage).

12 CONCLUSION

The culture, elements of cultural space, as well as considerations regarding its value positive social-economic impact are fully integrated into the modern framework (from the international level to the local) of strategies, concepts, policies and normative regulation (responsibilities) with the purpose of preserving cultural heritage (e.g. a limited number of unique historical sites and structures) in urban structures.

However, its practical implementation has faced such problems as: insufficient administration capacity and financial basis; incomplete information on cultural objects; occurrence of unforeseen global risks (common social economic decline, political instability, shifts in priorities and preferences, etc.) and technological impact (e.g. use of technologies for heritage data collection, process and use). In near future exactly

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implementation of common framework of national digitized spatial data infrastructure (compliance with requirements of INSPIRE directive and implementation of GIS solutions particularly in spatial planning) will be challengeable also for heritage protection sphere due to large number collected, but not standardized and published yet information, which is important and widely used in spatial planning, construction process, estimation of property value, arts industry and science, general education, property management, avoiding of failure of property markets, etc.

The planning is holistic activity of the public sector and requires daily cooperation with numerous institutions and other stakeholders, appropriate data bases, resources and skills, implementation of technologies, following global social political trends, public involvement and continuous monitoring of the balance of planning related interests (e.g. private, entrepreneurship, institutions, environment, heritage protection, realtors).

All problems in support of residential function (e.g. survival of cultural heritage buildings) in the HCR and its PZ can be divided into two basic groups: spatial planning related problems (addressing the design of urban space and its infrastructure and other (social economic, systemic and institutional culture) problems. Depopulation is a complex (common or global) problem whose solutions are more complex than functional zoning can provide.

Its consequences in areas such as HCR are low demand of residential space (low market and construction activity), necessity to attract international capital (investments) to support local property market, increase of quality of building stock (unpopulated buildings), increase of quality of architecture and public space (loss of cultural values); heterogeneous development of public infrastructure, growing pollution, less security (rising crime and violence).

Current planning documentation of HCR provides sufficient information and available on-line regime, but information is not “GIS based” and integrated with other state registers and social-economic information. Today spatial planning requires more smart ICT solutions (particular GIS) involvement in spatial planning data development, publishing, updating and exchange.

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14 REFERENCES

[1] Agenda 21 for culture, Innovation Partnership on Smart Cities and Communities, [cited 01.March, 2015]. Available from Internet: http://www.agenda21culture.net/

[2] Archer, P., Charvat, K., Navarro, M., Iglesias, C. A., O'Flaherty, J., Robles, T., & Roman, D. (2013). Linked Open Data for Environment Protection in Smart Regions–The SmartOpenData Project., ENVIP conference;

[3] Barvika, S,; Rausis,; A, Bezina, I. Opportunities for the Development of the Latvian Property Tax Administration System through Improvements in the Property Registration System and the Implementation of European Union Requirements for Geospatial Information, 19-23 May, 2013, Rome, Italy, Real Corp 2013.;

[4] Binding Regulation of Riga Historical Centre and its protective zone (Resolution No. 832 of 07.02.2006), 2006 .Riga City Council;

[5] Blackledge, M. 2009. Introducing Property Valuation. London: Routledge, 390.

[6]Cabinet of Ministers, order No. 462: Concept on Improvement of Cadastral Valuation System and Cadastral Data Update, 2012. [online], [cited 03 March, 2013]. Available from Internet: http://www.likumi.lv/doc.php?id=251895 (in Latvian);

[7] Charvat, K., Barvika, S., Alberts, M. Linked Open Data for Environmental Protection in Sm art Regions – the New Challenge for the Use of Environmental Data and Information. In: 19th International Conference on Urban Planning and Regional Development in the Information Society. Section: Plan It smart! Clever Solutions for Smart Cities (REAL CORP 2014): Proceedings, Austria, Vienna, 19-23 May, 2014. Vienna: 2014, pp.367-376. ISBN 978-3-9503110-6-8.;

[8] Charvat K., Alberts M., Ovacek M., Kolomaznik J., Vobora V., Kucera L., Barvika S., Allenbach K., Gorgan D. INSPIRE, GMES and GEOS Activities, Methods and Tools towards a Single Information Space in Europe for the Environment. - Rīga : Tehnoloģiju attīstības forums , 2009. – 170;

[9]The Development Strategy of the City of Riga 2014-2020, [cited 01.March, 2015]. Available from Internet: https://www.riga.lv/NR/rdonlyres/7D8D6ED6-DFE7-4188-A32C-2F6A1C2DB54B/48700/Attistibas_programma.pdf ;

[10] Development Strategy of the city of Riga, [online], [cited 01.March, 2015]. Available from Internet: http://www.rdpad.lv/rigas_planosanas_dokumenti/

[11]Electronic resource [online], [cited 10 January, 2015]. Available from Internet http://www.mantojums.lv/?cat=653&lang=lv (in Latvian);
[12] Pickard, R. 2006, European Cultural Heritage (Volume II) A Review of polices and practice. [online], [cited 10 January, 2015]. Cultural Heritage Department, Directorate General IV Education, Culture and Heritage, Council of Europe.
Available from Internet http://128.121.10.98/coe/pdfopener?smd=1&md=1&did=566207 ;
[13] European Cultural Values. 2007. [online], [cited 10 January, 2015]. European Commission. Available from Internet http://ec.europa.eu/public_opinion/archives/ebs/ebs_278_en.pdf ;
[14] Ingram, G.;K.; Yu-Hung Hong. 2012. Value Capture and Land Policies, Cambridge, Massachusets; 3-18.
[15] International Valuation Standards, 2011. International Valuation Standard Council, London, 122.
[16] Īpašuma departamenta ziņojums par situāciju ar graustiem Rīgā. [online], [cited 03 March, 2013]. Available from Internet http://rdid.lv/uploads/free/images/komitejai_15.8.2011_par_graustiem.pdf (in Latvian);
[17] Kultūras pieminekļu īpašnieku attieksme pret kultūras pieminekļu statusu kā apgrūtinājumu. Valsts pārvaldes institūcijas pasūtītais pētījums. [online], [cited 28 September, 2011]. Latvijas Zinātņu akadēmijas Ekonomikas institūts, Available from Internet http://www.km.gov.lv/lv/ministrija/petijumi.html (in Latvian);
[18] Kultūrvēsturiskā pieminekļa statusa ietekme uz nekustamā īpašuma vērtībām. 2013. [online], [cited 10 January, 2015]. The State Land Service, Available from Internet http://kadastralavertiba.lv/wp-content/uploads/2013/08/Nekustam%C4%81-%C4%ABpa%C5%A1uma-tirgus-p%C4%81rskats_31.07.pdf (in Latvian);
[19] Market Place of the European Innovation Partnership on Smart Cities and Communities, [cited 01.March, 2015]. Available from Internet: https://eu-smartcities.eu/ ;
Territorial plan for Riga 2018-2030, cited 01.March, 2015]. Available from Internet: http://rdpad.lv/uploads/JRTP/index.php ;
[20] Par Rīgas vēsturiskā centra saglabāšanu un aizsardzību: LR likums. [online], [cited 28 September, 2011], Available from Internet http://www.likumi.lv/doc.php?id= 76001&from=off (in Latvian);
[21] Powelson, J.;P. 1987.The Storey of Land. A world history of land tenure and agrarian reform, Camridge: The Lincoln Institute of Land Administration, 347.;
[22]Planning of the Riga Historical Center and It's Protection Zone Territory, Explanatory Memorandum, 2006. City Development Department, Riga City Council.;
[23]Pūķis, M.; 2008. Kultūras mantojuma sociālā un ekonomiskā loma, Rīga, 26,;
[24] Recreational & Leisure Property Valuation around the Baltic Sea. Baltic valuation conference proceedings, Klaipeda, Lithuania, 11-13 September, 2008, Editorship: Steponas Deveikis, Birute Galiniene, Petras Grecevičus. Vilnius, LTVA, 111;
[25]Spatial plan of Riga 2006-2018, 2006. [online], [cited 10 January, 2015]. Riga City Council. Available from Internet http://www.rdpad.lv/uploads/Spatial_plan_of_Riga_2006_2018_EN.pdf ;
[26] Sustainable Development Strategy of Latvia until 2030, [online], [cited 01.March, 2015]. Available from Internet: http://www.varam.gov.lv/lat/pol/ppd/?doc=13857 ;
[27]The Appraisal of Real Estate, 2008. 13th edition: Apraisal Institute, Chicago, 742;
[28]The Cost Approach For Tangible Assets, 2012. InternationalValuation Standarts Council, London.
[29]The Criteria for Selection to be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria. [online], [cited 10 January, 2015]. Available from Internet http://whc.unesco.org/en/criteria/
[30]Value (personal and cultural), [online], [cited 10 January, 2015]. Wikipedia. Available from Internet http://en.wikipedia.org/wiki/Value_%28personal_and_cultural%29 ;
[31] Williamson, I.; Enemark, S.; Wallace, J.; Rajabifard, A., 2010, Land Administration for Sustainable Development. Redlands, California: Esri Press, 506.