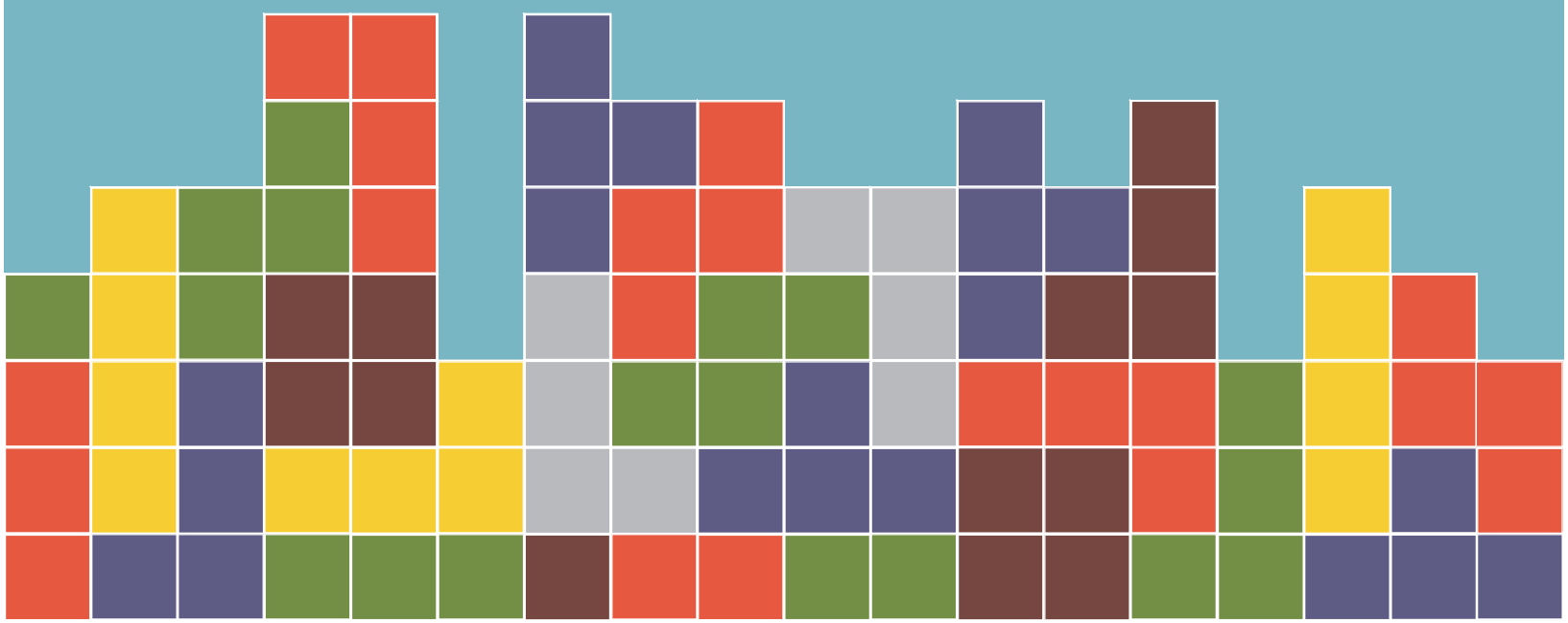
VIBRANT URBAN SOLUTIONS FOR BALTIC CITIES

edited by Sławomir Ledwoń & Hanna Obracht-Prondzyńska

ISOCARP
Knowledge for better Cities

GDAŃSK UNIVERSITY OF TECHNOLOGY



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Sławomir Ledwoń
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The Hague 2016

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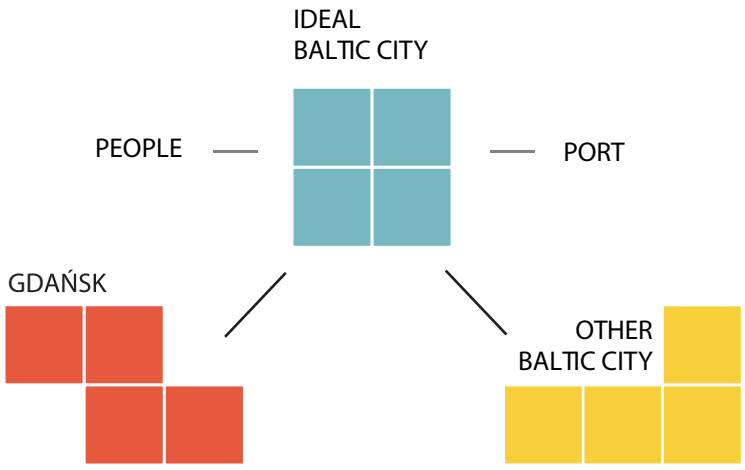

IDEAL
BALTIC CITY
PEOPLE
PORT
GDAŃSK
OTHER
BALTIC CITY

MSRL 2.0. AS A NEW METHOD FOR RESEARCH EDUCATION ON CITIES AND REGIONS

Sławomir Ledwoń, Hanna Obracht-Prondzyńska
Faculty of Architecture, Gdansk University of Technology

1. MENTOR & STUDENT RESEARCH LAB

We used to call an event that is organized for the first time as an innovation. However, when something is organized repeatedly, we may call it a tradition. If this is true, then the Mentor & Student Research Lab has become a tradition already!

The concept of MSRL 2.0 Vibrant Urban Solutions for Baltic Cities project, whose effects have been presented in this publication, emerged three years ago. The first edition of the program was held under the name Urban Transformations, and it accompanied the 2014 ISOCARP congress, which was at the time organized in Gdynia. There, for the first time, the effects of our project have been presented.

The initial idea was to reach outside the classical scheme of scientific workshops and researches. Mentor & Student Research Lab is a program that offers a unique opportunity of conducting

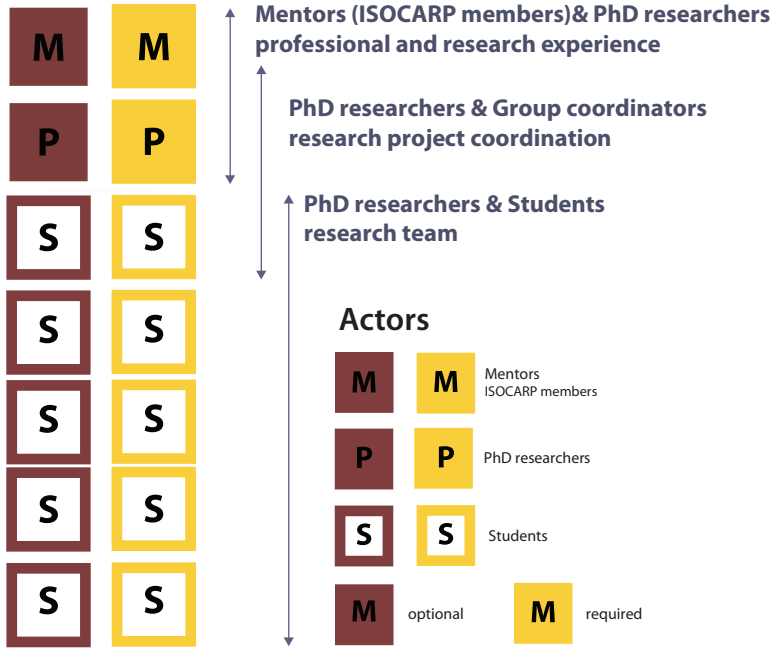


Fig. 1. Core theme of MSRL 2.0. research
Source: MSRL team

Fig. 2. Who is involved in MSRL research?
Source: MSRL team

Sławek Ledwoń
ISOCARP Vice President
Congresses and Events
<ledwon@isocarp.org>

I would like to invite everyone interested to organise the next Mentor and Student Research Lab.
The first edition was very exciting and challenging for us. We were inventing the process, inviting first mentors and not being entirely sure if it will take on. But just after the first workshop we knew it was a great idea and the proof was having everyone enthusiastically involved in the project. Each participant had their input and share, but also gained new and exciting experience – from the mentees to the mentors, and also the organisers. Immediately we wanted to organise the second edition, which came to life two years later.
I believe that this kind of projects can make a difference both to the mentees and mentors and everyone will learn something new. Organisation of MSRL workshop is not that complicated and does not involve much resources. The hard costs are travel expenses of mentors and the final publication. For other we managed to receive in kind contributions.

Would you be interested to host MSRL 3.0? Let us know <msrl@isocarp.org>.

research both by students, and experienced planners. The first and the second edition were held in Gdansk University of Technology, and were organized by ISOCARP in cooperation with the City of Gdansk. Below is an outline of the concept of this innovative method, and an explanation regarding the process of running the workshops, benefits that come from their organization, and a summary regarding the results.

After three years of the project, after numerous experiences of organizers, reviews given by participants, commentaries of observers, and, in consequence, continuous improvements, today it is safe to state that the mentor project has become a new method of work. After all, these three years represent an engagement of over 20 organizers, 3 supervisors, over 100 participants – PhD students and students, and last but not least 10 mentors from various areas of the world, who supported the work of the teams.

A direct result of activities undertaken by the MSRL family is a number of science publications. Equally important is that the knowledge, skill, and experience acquired throughout MSRL all add to the enrichment of research workshop of the participants. During this time, from a cloud of ideas, unclear expectations, and goals – a program emerged. The concept today can be described as a brand, and its formula – as a work model. A program, which became a platform for cooperation and exchange of experiences, in order to strengthen initiatives of sustainable urban development on an international, regional, and local level.

During this intensive work, each taking three months, there was an opportunity of cooperation between international teams, which comprise both from architects and infrastructure planners of varied experience. Their task was to inspire, hint, and share their knowledge, which all adds value to projects realized within MSRL.

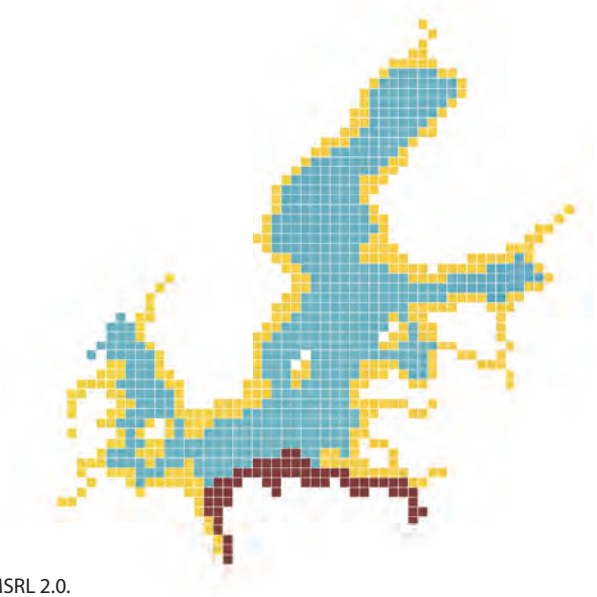


Fig. 3. Focus area of MSRL 2.0.
Source: MSRL team

One could also say that MSRL is a meeting of individuals fascinated with contemporary cities, who want to share their knowledge with younger, less experienced, or even purely beginner researchers, who are just taking their first steps into the world of science.
To some extent, MSRL project is also a response towards challenges that are faced by current academic schooling. Most of all, it provides a possibility of contacting researchers from all over the world, and integrating local scientific community. What is more, it creates a possibility of cooperating between practitioners responsible for realizing public policy (within planning), and researchers, and a team of students and PhD students who are preparing for their new, professional roles.
Limited duration forces teams to develop their own work methods. It is not simple, because after all, these teams are internally diverse – mentally, in regard to their work style, their cultural features, generational experiences, and also competences, experiences and expectations. In such situation, continuity and consistency in cooperation is essential. During short workshop meetings, an idea and methodology is bound to emerge. But a large part of the project, due to engagement of persons from different research centres from Poland and from different countries abroad is conducted remotely. Together, they need establish a common ground where youth and ambition meet with experience, professionalism, and methodology to discuss issues related to both the city, and its region.

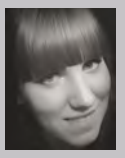
2. FROM INNOVATION TO TRADITION – MSRL 2.0.

2.1. TOPIC

While the formula, however constantly improved, is not subject to change, the topic tackled within the research projects is different in each edition. It must be remembered that teams in their research are asked to concentrate primarily on the local area – Tricity region in Poland, while at the same time addressing issues and good practices that will be valid for foreign cities.

Topic must be selected in such a way, that it allows a possibility of narrowing the research field in accordance with scientific interests of students and PhD students. At the same time, it must be attractive to potential mentors from all over the world. Therefore, in this edition the MSRL research is focused on the Baltic Sea Region (BSR) as a multidimensional urban phenomenon with Gdansk acting as a hub for the research teams. The idea of the MSRL is to promote the collaboration of professionals and graduate and PhD students by bringing together the mentor(s) with a local research team sharing experiences and proposing strategic recommendations to strengthen sustainable urban development initiatives for BSR at the international, regional and local levels:

- **BSR cities and networks: challenges, visions, ways forward. How are the Baltic cities connected?** How could their planning and design be integrated? What are the mutual influences and co-dependencies of the cities? How do these connections react in the architectural and spatial forms of the cities?
- **Maritime spatial planning as a tool and process.** How to integrate and bring together land (the coast) and water (the sea) in architectural and planning perspectives? What are the lessons from other coastal cities? What are the new threats and challenges that need to be addressed by planning?
- **Multicultural coastal cities: new challenges of urban policies.** How do urban traditions and cultures meet and what is the spatial result of this meeting? What is the role of architecture and planning in that process? How to increase the resilience of the local cultures (architectural heritage, the local uniqueness)?
- **Integrating eco-systems approach into design in coastal cities.** How can the integrated



Hanna Obracht-Prondzyńska
project coordinator

MSRL 2.0. is a project that consumes attention and requires full engagement of organizers, participants, and mentors. Surely, it would not be successful if not for the great atmosphere cared for by all the participants.
Here, I would like to wholeheartedly thank those who became a part of MSRL family. Exceptional consideration should go to: **Martina van Lierop, Pedro Ressano Garcia, Giorgio Gasco, Irina Shmeleva and Othman Al-Mashhadani** who, thanks to their visits in Gdansk, and a several-month-long support from different corners of the world, the whole time inspired all of us to work on MSRL researches. This project would not end with such a spectacular success if not for doctoral students who supported students' teams and coordinated work inside the groups. But most of all, we would not be presenting this publication if not for the positive energy, persistence, and hard work of almost 60 students. All who have worked on the project deserve immense applause.
However, we must not forget that the project would not yield effects if not for the team of organizers, whose help proved essential. Here, firstly I would like to thank all project keepers, that is: **Sławomir Ledwoń, Łukasz Pancewicz** and **Tomasz Rozwadowski** who supervised the work of MSRL family for almost a year of project preparations and realization! Also, I could have always counted on **Hanna Kurlovich**, and doctoral students: **Alicja Stefańska, Anna Rubczak** and **Marta Rusin**, as well as students: **Agata Hinca, Hanna Olszowa, Aleksandra Urbańczyk**, to whom MSRL owes graphic design.
In the end, on behalf of the whole above-mentioned team, I wish to thank the **Authorities of Architecture Faculty of Gdansk University of Technology** and **the President of the City of Gdansk** whose support allowed to create an international platform for research on the cities of the Baltic Sea.

Fig. 4. MSRL family (first workshop)
Fig. 5. Tasks & Benefits
Source: MSRL team

Tasks

M

1. Specify your research from the proposed core themes.

- It should be relevant to the Baltic Sea Region context but you are encouraged to bring the experience of your own city.

- It is possible to join the research with your own team of (PhD) students or colleagues to team up with the local MSRL team.

2. Supervise a team of your own young researchers.

3. Support the (PhD) student team with your skills and knowledge.

P

1. Leading the group of students.

2. Managing the communication between the mentor and the research group.

3. Supporting with your knowledge and ideas.

4. Effective cooperative learning. Assist with mentors and coordintaros.

S

1. Actively involved in international research work.

2. Actively involved in training activities and meetings.

3. Cooperation both with mentors and participants.

4. Responsibility for all work of each member of the group.

Benefits

M

1. Chance to lead and shape an urban or architectural focused research under your guidance and of your own design.

2. Opportunity to guide a dedicated team of PhD candidates and students who value your academic and professional input.

3. Participate in preparation of the report that addresses the relevant issues for the host city (Gdansk) and the Baltic Region.

The first MSRL report was published and distributed online. Printed copies were published and distributed during the ISOCARP Congress in Rotterdam in 2015.

P

1. Conducting scientific research internationally.

2. Publication of the results.

3. Mastering methodology application.

4. Mastering teaching methods.

S

1. International work with support of practicing urbanists and architects.

2. Extensive knowledge of designing process with high prospect for publishing internationally.

3. Obtaining and gathering research and professional skills.

environmental design be integrated into city planning and architecture of the coastal cities? How can regional scale be integrated with local solutions? What challenges do Baltic cities have in common?

- **Contemporary port and maritime industries as growth drivers.** What are the relations between the new economies emerging from the port infrastructures (the modern logistics, maritime industries, manufacturing, sustainable energy developments, shipyards, research and development and the city in economic, symbolic and material dimension?

2.2. METHOD AND PROCESS

Every project participant holds a prescribed role and obligations which he or she must fulfil during the three months of project duration. Foreign mentors establish research issue that relates to the main topic of the project. Their task is also to manage the teams and to share their knowledge and experience. Together with PhD students, they establish the methodology and the extent of the research.

In the whole process, PhD students hold a key role, because they intercede in communication between mentors and students. It is their task to coordinate and divide the tasks inside a group. It is an important experience for them, due to a possibility of partnership cooperation with already experienced scientists, thanks to which they gain knowledge necessary for conducting independent research in the future. At the same time, MSRL allows PhD students to improve their teaching skills due to a large group of students engaged in the project.

For students, on the other hand, the laboratory is a unique experience of working in an international environment. Thanks to contacts with Mentors they possess a possibility of acquiring an access to an international network of professionals and researchers, which they would not have otherwise. Teams benefit from the open minds of participants who act courageously and without limitations. Students are also able to devote considerable amounts of time into the project. Their enthusiasm towards changing the

2 editions · 2x3 months · **Mentor & Student Research Lab** programme

- *The future of MSRL...*
- *Do you have an idea?*

Platform for research (eg. from the second edition)

10 research projects

- *The concept of ecosystem services*
- *The identity of baltic region cities destroyed during World War II*
- *Creative solutions for waterfront cities in the context of climate change*
- *The differences in culture of urban planning management*

Resulting with **valuable recommendations**

- *such as Public Space Planning & Design Manual*

- *Propose the research...*

With (Poland) **Gdansk** University of Technology as a hub

- *Become the organiser...*

Promoting the **collaboration of international professionals** with a **local research team** by sharing experiences and proposing strategic recommendations to strengthen **sustainable urban development** by bringing together:

10 Mentors

100 Paricipants

Mentors (ISOCARP members) · **PhD students** · **Students**

- proposing the research
- supervising and leading the team of young researchers
- actively involved in international research work

Former mentors: Ric Stephens, Christian Horn, Alexander Boakye Marful, Markus Appenzeller, Martina van Lierop, Pedro Ressano Garcia, Giorgio Gasco, Irina Shmeleva, Othman Al-Mashhadani

- *Become mentor or participant...*

With the results **prepared**:

- during workshops
- working online

and presented:

- at the conferences
- in **publications** available: http://isocarp.org/mentor-student-research-lab/

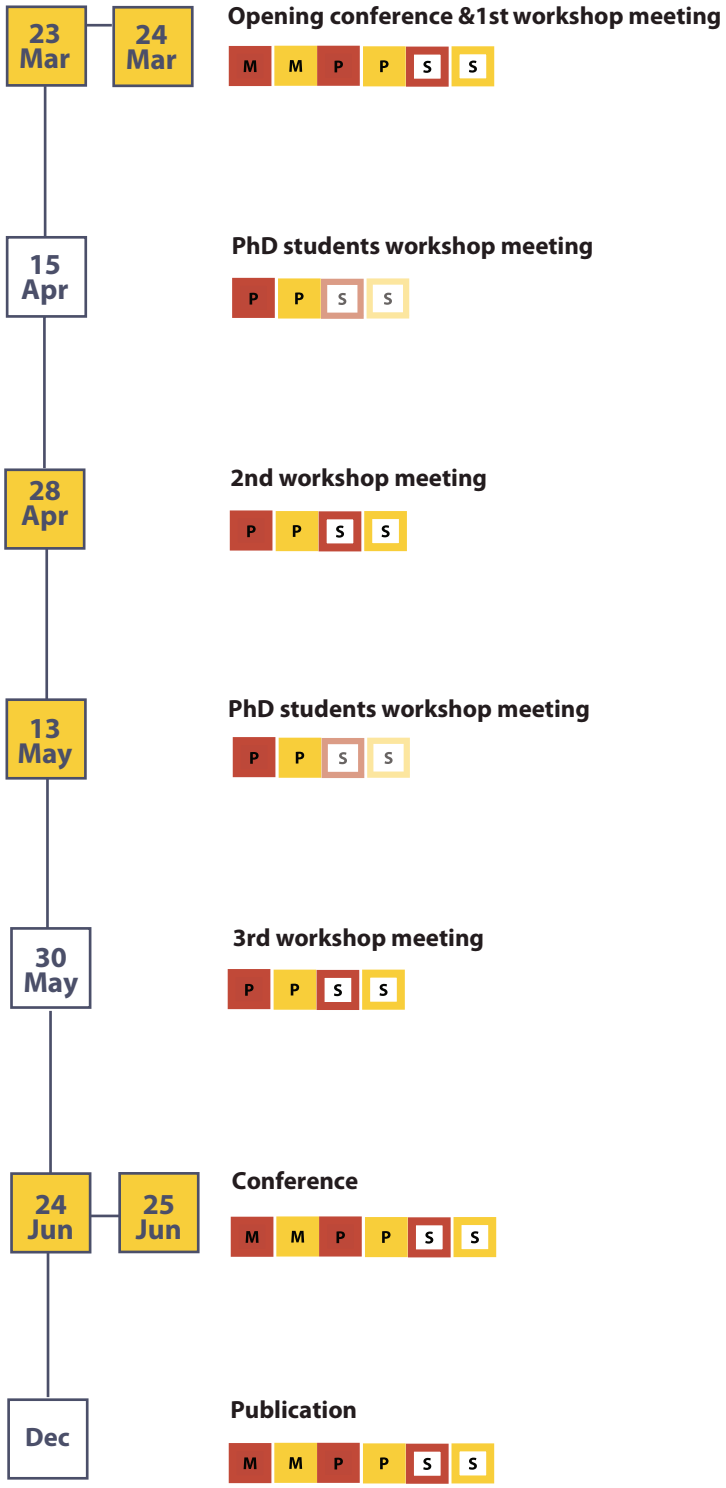


Fig. 7. MSRL 2.0. Timeline
Source: MSRL team

world is also of importance. Young people can reach wider audience of addressees compared to articles of purely academic contents. Often, their participation in the laboratory is a first-time experience of research work. It is important for their future careers to have these skills and also try something new. It allows to strengthen local contacts, and to show that they are able to deliver interesting results. Establishing presence on international arena is an added benefit.

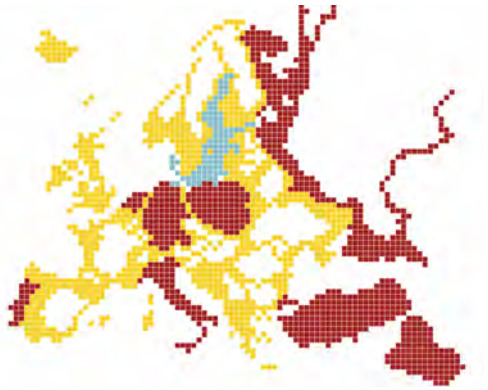


Fig. 6. Where did we work within MSRL 2.0.?
Source: MSRL team

2.3. THE MSRL FAMILY

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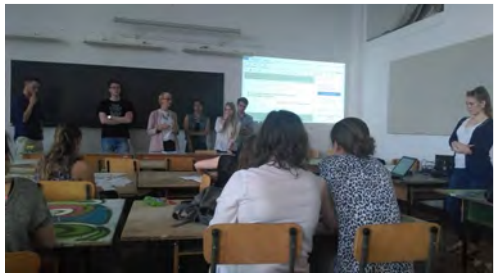

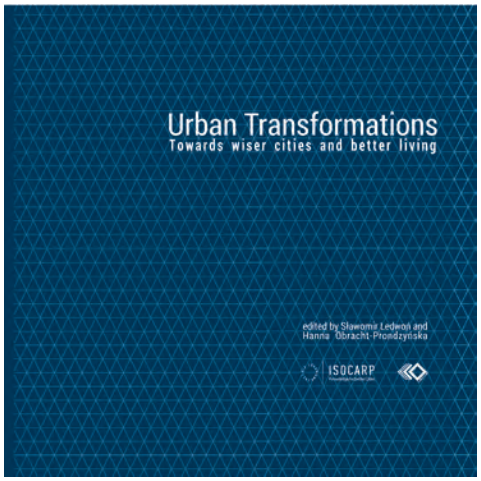

[1] Ledwoń Sławomir, Obracht-Prondzyńska Hanna (eds.) Urban Transformations. Towards wiser cities and better living, ISOCARP, Gdańsk-Haga, 2015

[2] Rusin Marta, Kreps Jessika (eds.), Public Space Planning&Design Manual, ISOCARP, Gdańsk-Haga 2014

[3] http://architektura.muratorplus.pl/krytyka/przestrzen-miejska-top-5-inspirujacych-publikacji-online_6367.html

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3. RESULTS

Each edition of the project ends with a publication. The effect of the first project were two publications, from which Urban Transformations[1], similarly to this, contains 5 articles that summarize the work of all teams, that were concentrated on topics such as:

- The mobility boosters, improving sustainable mobility,
- Smart infrastructure: case study of Gdynia, waterfront city
- What kind of city are we building? What kind of city do we want to build? Re-viewing three different urban developments in metropolitan areas,
- Medium size south Baltic rim cities – improving by learning from each other, project coordinator.

However, it turns out that students, within a period as short as this, are even able to develop a much more extensive material. Thus, two separate publications were prepared, independently by teams, where participants presented the accomplishments of their work. The most popular publications among the MSRL results surely include Public Space Design & Planning Manual[2], available at ISOCARP website. The team comprising of Polish and American students, working under the supervision of Ric Stephens created a peculiar design manual which consists of an interesting tool, possible for use by city authorities, citizens, planners, animators, and local activists. This is a value added of the project, which was not intended from the start, but rather conceived by the team themselves. Attractive graphically and substantively, the prepared publication is available at project's site. It contains guidelines for developing space, referring to aesthetics, the essence of building location identity, a possibility of using water and greenery. It stresses the importance of art in urban space, and points out the methods of activating local communities. Publication contains 67 recommendations inspired by locations from all over the world, for all actively acting in favour of the quality of our urban spaces. Manual's popularity is confirmed by it being distinguished among 5 top publications available online[3] that regard developing public spaces.

It is worth to mention that due to a large audience of all publications and intensive international promotion and within local academic community, the MSRL is proud to be numerously quoted, which encourages continuing the program, and to organize next editions.

The team of organizers, participants, and primarily the authors invites the reader to familiarize themselves with this publication. Due to a wide extent of research, a number of references to different locations in the world, and a whole set of recommendations, both research and project, the authors hope that the reading will be inspiring, inciting reflection and encouraging for undertaking further works.

MSRL AND THE REAL-LIFE PROCESSES OF CAPTURING AND IMPLEMENTING THE "URBAN INNOVATIONS"

Lukasz Pancewicz, Tomasz Rozwadowski
Faculty of Architecture, Gdansk University of Technology

Result of the MSRL workshop, five research projects, reflect on a broader process of exchange of the ideas between the cities, that is occurring in the real life and became one of the driving factors of the urban development nowadays. The objective of the MSRL research - concepts, which help to advance the development of the cities, support the improvement of the quality of urban environment or meet the future challenges, can be called as "the urban innovations"[1]. Identifying them and effective implementation is critical for ability to attract and retain highly-qualified work force and building the quality of urban life.

[1]The term was used by inter alia by the New Cities Foundation (a non-governmental organization) and described as it as a process: "Urban innovation is about finding new ways to address challenges faced by cities and urbanites", source: http://www.newcitiesfoundation.org/about/what-is-urban-innovation/. Such innovations can be materialized as new policies, management practices, actual projects, bottom-up initiatives etc. The EU also recognizes the importance of such innovations identifying them as Urban Innovative Actions.

There are at least two factors that help to understand how such city improving concepts are "travelling" and are implemented by the cities. The first point of reference are the regional linkages and networks, which built the environment in which the innovations are exchanged. The others are the actual mechanisms of exchange via building the local capacity of the cities through learning, testing and disseminating. In all cases, the cities are the focus of the research as they play major role in being a testing ground for the new ideas. Both of them were identified by the MSRL teams and utilized in their research. In all cases, the research also demanded from the practitioners to leave their "comfort zone" and explore the concepts which are not architectural or urban design in nature but are only loosely associated with the urban phenomenon.

THE ROLE OF SUPPORTING THE TRANS-BORDER COOPERATION AND THE MSRL

The MSRL is not a typical academic project, which normally would focus on the particular topic but it can rather be seen as a new teaching formula, where students and mentors together to jointly solve an established problem. At the same time, since its inception, the project explores how various global city planning concepts can be successfully exchanged and implemented. In that sense, MSRL reflects actual policy evolution processes, which occur in the real-life world.

Therefore, methodologically, the MSRL is a form of exercise in comparative studies with a strong focus on actual planning practice and case study research rather than a mere exploration of the planning theory or a typical studio design. Its key objective, from the academic standpoint, is to generate the knowledge on the best practice practices and the opportunity of their application in the local conditions. For the MSRL it is also equally important to practically explore the mechanisms and conditions of how the "city changing" ideas may travel, the conditions under which they can be applied. This is provided by a person of a Mentor - a global practitioner, who represents an external perspective and provides necessary input to reinterpret it in the localized context.

The current edition of the project aimed to establish the new references for the regional cooperation and to teach the importance of the cities and regions in the development of the countries. That was the reason of focusing the second MSRL on the Baltic Sea Region (BSR) and on the Tri-City as one of

the main cities and key economic and cultural nodes, in the southern Baltic. Gdansk also became a testing or proving ground for the new ideas. The geographic proximity and regional focus was not the only factor. More important drivers, such as the fact of sharing of the common resources and conditions as well as the current and past social and economic linkages, functioning as the vehicles for exchange of information, influenced the choice of the MSRL project scope.

BALTIC SEA REGION AS A FOCUS - THE CONTEXT OF THE MSRL

BSR as a whole is a strong region, when considered through the analysis of factors such as economic viability, health indices or environmental performance - it classifies as one of the top in the World[2]. Notwithstanding its overall attractiveness in global terms, its cultural and economic diversity, makes BSR a great laboratory, worthy of thorough, detailed observation. The general conditions of Baltic cities and knowledge on how to manage and transform cities are equally valid subjects of analysis. The region has a long and recognized tradition of inter-Baltic cooperation. Joint, cooperative building of its wellbeing started with Hanseatic League and later economic networks and nodes created around the sea lines of communication. The coastal cities always played a key role in exchange of goods and joint governance and today such concept is reflected by the European regional development strategies[3].

Today the globalized economy promotes and amplifies the economic power of cities and their respective regions rather than the traditional nation-States. The mechanism of such change and its objective remains the same: cooperation and joint generation of wealth as a result of synergic relationships and spatial and functional centralization and accumulation of the capital and people[4]. In the scale of the urban region it opens chances for the larger, metropolitan cities and the small and medium towns that are located in their areas of influence, once they join the cooperation. The connections also extend into wider, regional context, created by the existing interconnections between the cities, as the case of the Baltic region[5].

Apart from the more traditional areas of exchange - such as joint maritime economy, transportation networks, development of the fishing industry and energy sector the new concepts such as tourism or innovation-based economy emerged and developed as the common areas of exchange for the region . The researchers such as Florida[6] or Ehrenhalt[7] made references to the relationship between the cities, their changing geographies of living and employment, quality of it and the concentration of actors (people, businesses and institutions) related to the innovation-based economies. Even if the ideas of "creative classes" had been criticized[8] the cities didn't refrain from using their respective competitive advantages, stemming from various sources, to maintain and increase growth. Cities in higher-income countries aim to build on the high-value added industries[9].

The concept of innovation-based economies not only becomes a primary theme of regional development strategies but it also reveals substantial differences and discrepancies[10]. Here, there are cities that lead in supporting the development of the industries and the cities which are lagging in supporting the growth of such activities. This is reflected inter alia by the statistics of the employment in the key, knowledge-intensive services: Hamburg 40%, Copenhagen 64%, Gdansk 25%[11]. One of the factor contributing to such differences at least partially are resulting from the different paths of historic economic development but also current development conditions and the history of transformation[12]. The idea of "catching-up" which is often promoted by the city's Authorities, is also grounded in economic reality of the BSR cities. Since 2005 their economy, measured by the change of their share in the GDP (Gross Domestic Product), grew by almost 55%[13], which corresponded with the projections on the economic convergence of the western Europe, predicted by the OECD[14].

[2]Ketels C., Pedersen H., State of the Region Report 2015, (2015), Baltic Development Forum DK-1450 Copenhagen, Denmark

[3]including the official planning such as European Union Strategy Baltic Sea Region (EUSBSR) a macro-regional strategy in Europe and the corresponding actions legal bodies, responsible for the cross-border cooperation such as HELCOM (Baltic Marine Environment Protection Commission - Helsinki Commission)

[4]Antonelli C., Patrucco P., & Quatraro A., (2011), Productivity growth and pecuniary knowledge externalities: An empirical analysis of agglomeration economies in European regions. Economic Geography, 87(1), pp. 23–50

[5]ibid

[6]Florida R., Mellander C., (2014), Rise of the Startup City: The Changing Geography of the Venture Capital Financed Innovation. CESIS Electronic Working Paper Series, No 377

[7]Ehrenhalt A., (2012), The Great Inversion and the Future of the American City, Vintage Books, Nowy Jork

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Regardless of the common economic ties, the cities of the BSR region are also connected by the jointly shared issues and challenges. The environment factors are amongst the most important of them, comprising the topics such as water quality, the demands of protection of endangered species or the risks associated with climate change including protection against the extreme weather events. Last but not least, the cities are connected by its specific, local identity which continuously evolves as a result of increasing cultural globalization.

All in all, the key role of urban areas as the drivers of economic growth in turn strengthens the importance of the "innovation for cities". They can be characterized as new measures: projects, policies, management practices, that allow the urban regions to both increase their economic efficiency and success regionally and globally. The innovation foe cities can also help them to meet the new challenges: to react better to the demographic changes and thrive with the help of potential created by the migration or build resilience and minimize the environmental impacts. The EU and regional authorities had recognized that vast majority of such innovations are being generated, tested and implemented in cities. As a result, the support for the cities as well for their partnerships formed a backbone of the new EU Urban Agenda - the Pact of Amsterdam[15].

The partnerships emerging from the networking of the cities functioning as a vehicle of mutual learning, seems to be one of the main preconditions for finding and sharing the urban innovations between the cities. The other one is a genuine, trans-border cooperation aiming at the exchange of policies and practices by the municipalities. This occurs by multiple ways including peer-to-peer cooperation between the municipal authorities, national level cooperation and the academic joint research, which also have strong territorial and regional focus[16]. In the real life such concept formed a backbone of the EU projects such as URBACT, which exclusively focused on networking of cities and solving, in practice, the current major urban topics via pragmatic, applicable solutions[17]. Initiatives such as the "Covenant of Mayors"[18] also put importance on the city generated and tested innovations in the fields of Energy and Climate Change Adaptation, that are disseminated, tested and compared via the interurban networks. The MSRL draws inspiration from such concepts.

FUTURE ARCHITECTS AS RESEARCHERS AND DEVELOPERS OF THE "URBAN INNOVATIONS"

Apart from the system of the support for the development of the "urban innovation", their development cannot proceed without grounding them in the localized context of the cities. One of the reasons is the that the urban change is governed in equal measure by the forces of globalization as well as their local specificity of the cities - the administrative and historic contexts or their specific economic profiles or merely the local governance.

The other important factor is the level of complexity of the modern cities puts more demand on the people, who manage them. The older tools aimed at "solving problems" of the cities, used by the architects - urban design concepts, the traditional masterplans, left alone are insufficient in helping to solve more complex urban and spatial issues such as urban regeneration or environmental management. Here the solutions lie outside of architectural or urban design concepts. The successful implementation of any of the advanced urban strategy is increasingly dependent on interdisciplinary work, often with various parties, representing non-architectural expertise. That in turn demands good leadership and management skills to implement it in practice. Local transparency and governance became as important as the technical skill and managerial expertise[19].

The practitioners, if they wish to successfully participate in developing or implementing "urban innovation", must therefore build their capacity to do so. The traditional approaches to technical education, that place importance on "hard" technical skills does not necessary equip future

practitioners with "21st century skills" that would allow them to innovate to meet the urban challenges. Here the researchers point to the important role of the academic education in providing early training to meet the future challenges[20]. The problem does not also affect the architects or planners in process of training but more importantly is affecting the current practitioners.

The need to change to current approach was also recognized by the European institutions (OECD[21] and the European Commission[22]) which initiated the discussion on the need to support institutional change towards public sector innovation. Planning, as one of the key services of the local governments, is clearly one of such fields that need improvement. The Commission report highlighted that public institutions need to take more entrepreneurial approach which include more risk-taking, more open attitude towards experimentation, end embrace the co-designing and co-creation. The ability to challenge the existing rules, if they are hindering the development of better ideas has also been proposed.

The factor of trans-border learning by implementing good practice examples, applied through a peer-to-peer exchange is gaining importance. In fact, the lessons learned from URBACT reports highlighted that almost 70% of world cities are involved in that form of learning[23]. The lessons from the participants of URBACT indicated barriers in transfer associated with the lack of capacity to absorb on one hand but more importantly the issues with the "'not invented here' syndrome"[24]. The measures to overcome this depended strongly on ability to critically assess the viability of the good practices and readapt them "at home". The URBACT assessment highlighted a number of elements of successful transfer: including the tailored partnership between "giver" and "receiver" of the innovation, the dedicated local team of supporters and also the role of the leading expert - an urban mentor, who is responsible for coordination of the innovation transfer.

One of the other key mechanisms identified in successful delivery of "urban innovation" was also application of the "learning by doing". More progressive cities attempt to harness such methodology and build their reputation, and regional position, on becoming laboratories and hubs for training and sharing of academics and practitioners. Creation of the Urban Innovation Lab in Malmo may serve as one of such examples of place which functions as a local "test-bed" of urban innovation, which support the whole region[25]. The project enabled participants to focus on shared development of ideas. Many cities are following such practice, supporting the development of respective hubs, including examples such as Amsterdam with Pakhuis de Zwijger centre[26] or Prague's city funded IPR (the Institute of Planning and Development)[27].

MSRL AND BUILDING THE CAPACITY TO ABSORB OR DEVELOP INNOVATION

The search for innovative tools and careful diagnosis of the existing potentials in the regions seems to have critical meaning for the development of the cities but it cannot proceed without a strong local support. The best results can be achieved by combining the strengths of cities with innovative methods of organization and cooperation as practice of the last decades shows . A vehicle for the transfer of this knowledge are always people and their collected and shared knowledge. In that sense MSRL project contributes to a broader and ongoing effort of cities to improve by innovating. The key result is the capacity building - preparing young architects and planners for taking active position in the process of discovering and prototyping future, new, better solutions for our cities.

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FINDING MULTIFUNCTIONAL SPATIAL SOLUTIONS AND DEVELOPMENT STRATEGIES TO RENDER BALTIC CITIES AND COMMUNITIES MORE SUSTAINABLE THROUGH THE CONCEPT OF ECOSYSTEM SERVICES

The Baltic Sea is object to several environmental issues such as eutrophication and loss of biodiversity. Additional, the coastal region faces future sea level rise and increasing anthropogenic pressure of urbanisation and tourism.

The main aim of this research is to find multifunctional spatial solutions and development strategies for Baltic coastal regions based on the ecosystem services concept which are more beneficial to the sustainability, health and resiliency of cities and communities in the coastal Baltic region.

Alongside the project has two sub-objectives:

1. to introduce the ecosystem services concept into the planning system of the Baltic region in particular in the Polish planning system.
2. to assess the contribution of the ecosystem services concept as an approach to design and plan multifunctional spatial solutions and development strategies. The ecosystem services concept will form the framework for the research-through-design process. The ecosystem services approach will form a framework for the main parts of the design/planning process: analysis, scenario development and assessment, and development of implementation strategies, and synthesis of solutions and strategies. Alongside the design/planning process the ecosystem services approach will be assessed.

Mentor:
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van Lierop

Freelance Landscape Architect
Practical and academic background with experience in interdisciplinary, participatory and international projects and teaching. Her work focuses on connecting environmental priorities with social and economic values in transdisciplinary design processes. Enjoys traveling, hiking, and meeting people.

PhD student:
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Related to the subject of sustainable design, modern residential areas and water management. In daily life a designer of public spaces and interiors. Passionate about travel, sun, people and everything what is beautiful

PhD student:
Anna
Rubczak

Gdansk University of Technology , Faculty of Architecture, Department of Urban Design and Regional Planning Interested in water-related design on various scales (regional planning, "architectural scale" during realisation). Privately mom of 2 sons, 1 dog, 1 rabbit and a model husband guardian.

Justyna
Król

Gdańsk University of Technology
Very interested in widely understood public space, role of greenery in cities and aspects that make the space attractive. Strangely drawn to redevelopment of historic and listed buildings.
Fascinated by everything elegant and visually pleasing.

Alexandra
Kuzniar

École Nationale Supérieure d'Architecture de Paris Val–de–Seine, Faculty of Architecture
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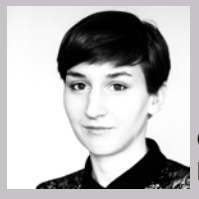
Interested in Baltic Cities and their urban development, and in the application of sustainable strategies.

Agata
Malengiewicz

University of Warsaw
Student of Spatial planning. Interested in solving all problems connected with using of space. Keen on using GIS method in urban planning. Recently is working on idea of a city square in her Master thesis.

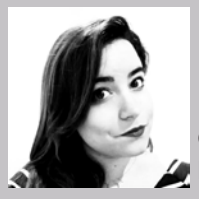
Paulina
Maścianica

Gdańsk University of Technology
Interested in how the physical space affects people on a social and psychological level. Privately, enjoys soap bubbles and sports.



Olga
Nowakowska

Gdańsk University of Technology
I wanted to become an architect since 8. I mainly focus in adaptive reuse of historical building and sustainable development of historical areas. Lately I began developing my interest in resilient cities subject.



Cristina
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Gdańsk University of Technology, Faculty of Architecture
After living abroad, she became fascinated by the connections and interactions between people and the spaces they inhabit and use, in particular, public spaces. Personally, she adores photographing architecture, street art, and new challenges.

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Werdon

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Interested in everything concerning quality of living in cities. A staunch proponent of sustainable transportation, walkability, greenery in cities and sense of community.
Privately, cautious with unhealthy food and a sedentary lifestyle.

FINDING MULTIFUNCTIONAL SPATIAL SOLUTIONS AND DEVELOPMENT STRATEGIES TO RENDER BALTIC CITIES AND COMMUNITIES MORE SUSTAINABLE THROUGH THE CONCEPT OF ECOSYSTEM SERVICES - THEORY AND METHODOLOGY

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PhD student Anna Rubczak , PhD student Anna Janus
Małgosia Werdon, Olga Nowakowska, Agata Malengiewicz, Cristina Rodriguez, Justyna Król,
Paulina Mascianica, Aleksandra Kuzniar

1. INTRODUCTION

What first comes to mind is the Baltic Sea itself which connects the region's different countries. A sea which is known as one of the most polluted seas in the world, though on its long way to recovery. On this way, still many environmental issues need to be tackled. A major issue is the eutrophication of the entire sea by external inputs of nitrogen and phosphorus, mainly with agriculture as the main source of this pollution (HELCOM, 2015). In addition, there is pollution from other chemical compounds as medicinal residues and heavy metals, litter and microplastics which harm the coastal and marine environments and eventually ends up at the fish at your plate (HELCOM, 2015). Fisheries put additional pressure on species and habitats (HELCOM, 2015). Ultimately the goal is to improve the health and biodiversity in marine, coastal and also terrestrial ecosystems. On top of the already existing problems, come issues related to climate change; sea level rise and more extreme weather conditions.

Yet, the Baltic Sea region is also a living space for the many people who are living along the coast. People who want to live in a safe and healthy environment where they can enjoy life and enjoy the benefits the environment of the Baltic Sea has to offer. Solutions for the many issues can therefore only be found when both people and environment are taken into consideration. Solutions which balance the needs of people and the environment. For this reason, we chose the concept of ecosystem services as our approach to find solutions that can benefit both people and ecosystems. The ecosystem services concept connects the nature and people through the benefits nature give to us. Although the concept is already established as a scientific approach and within policy frameworks on national and regional levels, the concept is relatively new for planning and design practices. The idea of linking natural processes and structures with the benefits and values for people, offers especially to planners and designers the opportunity to look with new glasses for sustainable solutions. With this study, we aimed to look for multifunctional spatial solutions for the Baltic Sea region from the perspective of the ecosystem services concept to render Baltic cities and communities more resilient, healthier and sustainable. On the other hand, is this study also a test case to introduce the ecosystem services as an approach in design and planning as well as a learning bed to introduce the ecosystem services concept itself and as an approach to future designers and planners. The region of Gdansk, and the Polish planning system formed the context for this study.

The main objective is to find multifunctional spatial solutions based on the ecosystem services concept to render Baltic cities and communities.

The sub-objectives are:

1. To introduce the ecosystem services concept into the planning system of the Baltic region in particular the Polish planning system.
2. To assess the contribution of the ecosystem services concept as an approach to design and plan multifunctional spatial solutions and development strategies.

2. METHODOLOGY

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The study has been conducted through a qualitative methods strategy in which a literature and desktop study was combined with case study research (Creswell, 2009). The study has been carried out in three steps in which each step built on the outcomes of the previous step.

The initial step was to gain understanding of the ecosystem services concept in general; what are ecosystem services? How does the ecosystem services concept connects to social benefits and landscape structures and processes? The literature study included scientific articles and reports as well as professional publications. The scientific and professional publications were reviewed for definitions of the ecosystem services concept while also keeping an eye out for any solutions for the improvement of ecosystem services provision.

In the second step, we expanded the study to gain insight which ecosystem services are currently present in the region. The coastal region from Gdansk to Kaliningrad was selected as research area to allow a concise analysis ecosystem services provision in the Baltic coastal region. The study included scientific and professional publications and materials concerning ecosystem services and (digital) maps of the case study area. This material was obtained through direct observations, desktop studies, and reference studies. Following, we studied how the current environmental issues of the Baltic region are related to ecosystem services, and what the potentials are to improve the provision of ecosystem services in the landscape of the Baltic region. This resulted in three major areas of research interest due to their differences in scale and environmental issues.

To analyse possible spatial solutions on how ecosystem services provision in the landscape of the Baltic region can be improved, the literature and desktop study were expanded, and moreover a case study research was added. The case study research looked into best case practices of the ecosystem services concept in planning, and spatial solutions from different places. The research area, however, helped to focus the case study research on spatial solutions relevant to the different scale levels in the Baltic region; from urban street level in Gdansk to linkages to the estuary landscape of the Vistula river, and the agricultural landscape of Żuławy. The case study research helped to turn the abstract descriptive theory on ecosystem services into more practical prescriptive guidelines. These design and planning guidelines are described in text and visualisation, and includes the potential ecosystem services for each spatial solution.

Finally, we reflected on the possibilities and challenges of the ecosystem services concept as an approach to design and plan multifunctional spatial solutions for the Baltic region, and in particular the Polish planning system. This reflection includes on our experiences with working as planners and architects with the concept of ecosystem services.

3. CONCEPT OF ECOSYSTEM SERVICES

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3.1. ECOSYSTEM SERVICES DEFINED

Twenty five scientific publications were analysed in order to define ecosystem services. We found synonyms for ecosystem services as: landscape services, green infrastructure, green-blue services, and nature's services. The most frequently description of ecosystem services were direct and indirect benefits provide for human from well- being from properly functioning natural ecosystems (Costanza et al, 1997; Daily, 1997; MA, 2003, TEEB, 2010). With benefits are meant the products or goods, and the tangible and intangible services people obtain from ecosystems (MA, 2003).An alternative definition was proposed by Boyd and Banzhaf (2007) - ecological components consumed or enjoyed to produce human well-being. For the purpose of this study, the TEEB definition TEEB D0) was chosen as it a widely acknowledged research study into ecosystem services, The TEEB introduces ecosystem services as the direct and direct contributions of ecosystems to human well-being, supporting our survival and quality of life.

The TEEB classification acknowledges seventeen ecosystem services categorized within four groups:

- Provisioning services - products obtained from ecosystem as fresh water, wood, food, medicinal resources.
- Regulating services - benefits obtained from the regulation of ecosystem processes such as local climate and air quality, natural hazard regulation, water purification and waste management, erosion control, pollination and biological control.
- Habitat services ecosystems that provide habitat for migratory species and to maintenance of genetic diversity.
- Cultural services include non-material benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation and aesthetic values.
- Each individual ecosystem service is described below. This classification provided direction in the study, yet is not used exclusively as it is not comprehensive.

Fig. 3.1. Word cloud with the different definitions of and related to ecosystem services
Source: Anna Janus

3.2. ECOSYSTEM SERVICES DESCRIBED

3.2.1. PROVISIONING SERVICES

PROVISIONING SERVICES

Provisioning services are all the material and energetic outputs from ecosystems (MA, 2003; European Environment Agency (EEA, 2011)). These include biotic and abiotic outputs such as wood, fresh water, and crops. In general, mineral resources such as oil, gas, or gold are not taken into account. The resulting products and goods are tangible, and can often be directly consumed, used, exchanged or traded (EEA, 2011).

FOOD

FOOD

This includes food products obtained from plants, animals and microbes (MA, 2003). Food production takes place in any environment, and many environments have been and are still currently altered to provide food resources. Within the ecosystem services concept, the focus, however, lies less on intensive food production systems, and more on food production within the natural abilities of an environment. This can include activities like fishing, hunting, berry-picking or mushroom-picking. One of the major challenges is to bring food production in balance with other ecosystem services.

RAW MATERIALS

RAW MATERIALS PROVISION

Raw materials can be derived plants, animals, and microbes, and be used for the manufacturing of other products (MA, 2003; EEA, 2011). Materials can be used for construction such as wood, reed and straw, or for textiles such as jute, hemp, leather, and silk, or even for ornamental use like flowers, shells and feathers. Materials can be gathered from every ecosystem. Important though is to balance this ecosystem services with other services.

FRESH WATER

FRESH WATER

Fresh water is a natural resource which is one of the best known goods ecosystems provide to people. Fresh water is essential for human well-being and a connecting element for different ecosystems. Ecosystems provide storage and purification of fresh water. Water is stored in streams, rivers, lakes, glaciers, and groundwater aquifers, while ecosystems as wetlands act as purifiers. Provision of fresh water is nowadays severely under pressure due to pollution, climate change, and overconsumption of water resources. Ensuring replenishment of aquifers, flow and storage, and purification (potability) will be major tasks for future provision of fresh water.

MEDICINAL RESOURCES

MEDICINAL RESOURCES

The importance of environmental health to human health has been made apparent in the Millennium Ecosystem Assessment (2005). This includes the provision of many medicines in traditional as well as modern medicine, food additives, pharmaceuticals, biocides (MA, 2003). People have since long used natural materials for curing different diseases, and still discoveries are made that moves medicine forward. The largest threat however is the destruction of ecosystems, over-consumption and destructive harvesting (Ahmad, Ahmad Malik and Shakya, 2013) as well as the extinction of species before their abilities to cure diseases can be discovered (Barata et al., 2016).

3.2.2. REGULATING SERVICES

REGULATING SERVICES

Regulating services are the "benefits from the regulation of ecosystem processes" (MA, 2003). Ecosystems, and in particular ecological processes, control and alter biotic and abiotic factors which are important for the people´s environment (EEA, 2011). These benefits have indirect use value (TEEB, 2010) which means they are not consumed, but influence "the performance of individuals, communities and populations and their activities" (EEA, 2011).

MODERATION OF EXTREME EVENTS

MODERATION OF EXTREME EVENTS

The moderation of extreme events is a regulating service that can help to diminish extreme events that might be a risk for people and their environment. The Economics of Ecosystems and Biodiversity (TEEB, 2010a) describes the moderation of extreme events as follows:

> "Extreme weather events or natural hazards include floods, storms, tsunamis, avalanches and landslides. Ecosystems and living organisms create buffers against natural disasters, thereby preventing possible damage. For example, wetlands can soak up flood water whilst trees can stabilize slopes."

From the TEEB definition, we can conclude that the moderation of extreme events acts as a preventive tool by introducing or re-introducing regulating elements that will keep those events from happening, or at least, minimize their effects.

EROSION PREVENTION AND MAINTENANCE OF SOIL FERTILITY

The Economics of Ecosystems and Biodiversity (TEEB, 2010a) describes erosion prevention and maintenance of soil fertility as follows:

> "Soil erosion is a key factor in the process of land degradation and desertification. Vegetation cover provides a vital regulating service by preventing soil erosion. Soil fertility is essential for plant growth and agriculture and well- functioning ecosystems supply the soil with nutrients required to support plant growth."

Wind and water can cause soil erosion which eventually can cause desertification. Erosion is in particular a threat to agricultural systems as Soil loses its fertility; reducing the chances that the soil can be used once again, and in such way also undermines services as food and raw materials. Water erosion can cause gullies which flush away the soil, eroding natural coastal protection, causing more frequent floods and damaging fish breeding zones by influx of muddy waters. According to Montgomery (2007, p13268), soil erosion depends on different factors such as: soil properties, ground slope, vegetation, and rainfall amount and intensity. To guarantee the quality and productivity of the soil, and as such preventing soil erosion, these factors should be considered within planning and design.

POLLINATORS

POLLINATION

The Cambridge Dictionary (Cambridge University Press, 2016) describes "to pollinate" as "to carry pollen from a male part of a flower to the female part of another flower of the same type". The process of pollination allows plants to reproduce and to develop seeds, nuts and fruits. As these products provide food sources for animals and people, pollination is a crucial service. If the number of pollinating insects significantly drops, the loss in the economy and nature will be irreversible (Regionalna Dyrekcja Ochrony Środowiska w Gdańsku. 2015). According to Klein et al. (2007 in TEEB, 2010a) "87 out of the 115 leading global food crops depend upon animal pollination including important cash crops such as cocoa and coffee. Pollination is provided by animals like insects as well as birds and bats. Some plants can pollinate themselves and others need wind to get pollen from one to another flower of the same species (United States Department of Agriculture, n.d.). However, many pollinators and plants have evolved together. This means that if one species of pollinator would become extinct, for instance the bumblebee, this would result in a decline or extinction of the plants this insect species pollinates, for instance aconite or red clover (Regionalna Dyrekcja Ochrony Środowiska w Gdańsku. 2015).

All around the world bees and bumblebees are under threat. One of the biggest factors of the

sudden die-out of insects is the widespread use of insecticides and pesticides from the group of neonicotinoids (GD, 2012). Though these products are used to protect crops from pests, they also have an influence on pollinating insects. Partly, this also has to do with wrong management of insecticides (GD, 2012). Another reason, are the diseases that now struck bee colonies. Especially, Colony Collapse Disorder (CCD) is dangerous. This disease was first noticed in USA, where entire colonies of bees died out of unknown reason. Considered as one of the probable causes for CCD are the pollen of genetically modified crops which might be harmful to bees (Save Our Bees, 2011).

BIOLOGICAL CONTROL (BIOCONTROL)

Biological control is "the control of pests and diseases by their natural enemies – predators, parasites, and pathogens" (Naylor and Ehrlich in Daily, 2007). Ecosystems regulate pests and diseases by offering room and habitat for biological control agents like "birds, bats, flies, wasps, frogs and fungi" (TEEB, 2010a). Though important for agricultural systems, it is due to modern agricultural practices as intensification, upscaling and the increase use of agrochemicals that biodiversity, and therefore the service of biological control, declined (Daily, 1997; Tscharntke et al., 2005).

BIOLOGICAL CONTROL

LOCAL CLIMATE AND AIR QUALITY

Certain terrain conditions such as mountains and valleys, the proximity of a sea or large water bodies like a lake, and also built up environments influence the local climate with sea and land breezes and for instance the urban heat island effect (Enviropedia, n.d.). With a local scale is often meant an area of a few to tens of kilometres across (Enviropedia, n.d.). Ecosystems also influence the local climate (MEA, 2003). Forests, but also other ecosystems, influence temperature, precipitation, and availability of water on local as well as on regional scale. Especially, in cities, trees and green spaces can help to moderate temperatures for instance by evaporation and providing shade, and in such way can contribute to reduce the urban heat island effect (Manns, 2014b). Plants also play a significant role in regulating quality of air by removing pollutants and dust of burning fossil fuels, farming, industry, and mining from the atmosphere (Kukreja, 20xxa; TEEB, 2010a).

AIR QUALITY

CARBON SEQUESTRATION AND STORAGE

"Ecosystems regulate the global climate by storing and sequestering greenhouse gases. As trees and plants grow, they remove carbon dioxide from the atmosphere, and effectively lock it away in their tissues" (TEEB, 2010). Carbon dioxide is expelled by animals, forest fires release huge amounts of it into the atmosphere along with volcanic eruptions and magma reservoirs deep beneath the ground, and by burning fossil fuels. Without this process, the surface of the Earth would quickly overheat (Bloch, n.d.). In particular, forests act as carbon storage; not only in the trees, also in dead organic matter and soils. Other important terrestrial carbon sinks are peat areas and wetlands, yet most carbon is stored in the oceans (Manns, 2014a). Next to being a sink for CO2, ecosystems "can also be a sink for tropospheric ozone, ammonia, NOx, SO2, particulates and CH4 (Manns, 2014b). With regard to climate change, carbon sequestration, and storage of other greenhouse gases, is an important mitigation measure (TEEB, 2010). Threats to this ecosystem service are deforestation and drainage of peat and wetland areas (Manns, 2014a).

CARBON SEQUESTRATION

WASTE-WATER TREATMENT

Waste-water treatment is the process that improves the quality of the water by filtering out and decomposing organic waste from humans and animals (MEA, 2003; TEEB, 2010a). Most waste is broken down by microorganism which reduces the level of nutrients and pollution and eliminates disease causing pathogens (TEEB, 2010a). Especially wetlands are important wetlands for waste-water treatment. This importance is increasingly recognised by governmental bodies all over the world. A well-known example is of the New York authorities who, after assessing the costs for a new infiltration plant, realised it would be more beneficial to pay landowners in the water catchment area of the city to improve the water and agricultural management in the area (TEEB, 2010b).

WASTE-WATER TREATMENT

CULTURAL SERVICES

RECREATION

TOURISM

ART INSPIRATION

SPIRITUAL EXPERIENCE

3.2.3. CULTURAL SERVICES

RECREATION, MENTAL AND PHYSICAL HEALTH

Biodiversity and ecosystems are very important for recreation opportunities that are based on nature. (Manns F., Wiehl D., 2014). Spending time among the green space helps to relax and maintain a good mental health of the citizens. Moreover, doing sports in green space is a form of physical exercise, very important for people's well being. The role of green public spaces has been widely recognised as an important, despite difficulties in measurement of the influence. (TEEB, 2011). Undoubtedly, it can have huge effect on economic productivity, and by that on prosperity of a region (Manns F., Wiehl D., 2014).

TOURISM

Tourism is to meet the needs or desires of non-residents of an area into moving to different destinations for short periods of time. Within the ecosystem services, tourism is more seen the "nature-based opportunities which attract travellers to a place to enjoy nature" (Manns, 2014c). As an economic activity, tourism has become a whole industry that provides travellers with different services such as hiking, camping, diving, and viewing wildlife and famous natural sites. For many countries, tourism plays a vital role in its income and economy (TEEB, 2010a). "In 2008, global earnings from tourism summed up to US$ 944 billion" (TEEB, 2010a). In recent times, sustainable tourism has emerged which intends to regulate pressure of tourism on natural sites in order to avoid the compromise of the site for future generations. Though tourism can be a threat to the attractiveness of an area, it also holds opportunities such as generating additional income for nature management and to "educate people about the importance of biological diversity" (TEEB, 2010a). Within sustainable tourism, there are many varieties which have been categorised by Swarbrooke (1999) as: ecotourism, cultural tourism, urban attractions, agri-tourism, and conservation holidays (holidays aimed to the pursue of conservation works during the vacation).

AESTHETIC APPRECIATION AND INSPIRATION FOR CULTURE, ART AND DESIGN

Biodiversity, ecosystems and, most importantly, natural landscape have been an inspiration for art thorough the history (TEEB, 2011). It includes paintings, drawings, design, music, literature and all other fine arts. It also provided inspiration for science, as smart design and architecture tries to implement solutions that can be found in nature (Wiehl D.,Manns F., 2014). Both language and knowledge have been always related to the natural environment (TEEB, 2011).

SPIRITUAL EXPERIENCE AND SENSE OF PLACE

Nature plays crucial part in majority of religions and traditional knowledge all around the world (TEEB, 2011). Moreover, cultural identity is very strongly connected to natural environment (Wiehl D.,Manns F., 2014a). All the customs associated with nature create and reinforce the sense of belonging (TEEB, 2011). Many natural features, such as specific mountains, forests and caves, have big religious meaning, or even are considered sacred (TEEB, 2011). They are are usually strongly placed in specific socio-economic, cultural, local context and those help to reinforce the sense of place and community's identity (Wiehl D.,Manns F., 2014a). Traditional spiritual connection to the specific place has a beneficial effect on the preservation of the nature (Wiehl D.,Manns F., 2014a).

3.2.4. SUPPORTING SERVICES

SUPPORTING SERVICES

HABITATS FOR SPECIES

As a supporting service, the habitat plays a fundamental role in the maintenance of ecosystems. A habitat is often defined as the environmental area which is occupied by a certain biological population; this means, that within the same ecosystem, different habitats can be found for different species. The Economics of Ecosystems and Biodiversity (TEEB) describes the habitats for species as:

> "Habitats provide everything that an individual plant or animal needs to survive: food, water and shelter. Each ecosystem provides different habitats that can be essential for a species' life cycle. Migratory species including birds, fish mammals and insects all depend upon different ecosystems during their movements."

HABITAT

The term ´habitat´ is often confused with the term ´ecosystem´. The main difference, is that, though ecosystems are not necessarily big in size, they comprehend a variety of populations that live in a community within a more or less complex system in which these different populations interact. A habitat is a specific area for one type of species. Habitats, just like ecosystems, do not necessarily be natural. The long history of agriculture in Europe made several species specifically adjust to farmlands.

MAINTENANCE FOR GENETIC DIVERSITY (BIODIVERSITY)

According to The Economics of Ecosystems and Biodiversity (2010a) genetic diversity is:

BIODIVERSITY PRESERVATION

> "the variety of genes between and within species populations. Genetic diversity distinguishes different breeds or races from each other thus providing the basis for locally well-adapted cultivars and a gene pool for further developing commercial crops and livestock. Some habitats have an exceptionally high number of species which makes them more genetically diverse than others and are known as ´biodiversity hotspots´"

A higher genetic diversity within a population decreases the chances that individuals will inherit the genetic weakness from the parents, and hence, making the population healthier and its survival rate higher. The preservation of genetic diversity is also in particular important as it is unclear which species might be of use for people in the future, or which species are essential to the maintenance of ecosystems and their ability to provide ecosystem services (Manns, 2014d). In agriculture, therefore, there is an increased effort to collect many local varieties as these are better adapted to local conditions which might be essential for human well-being in the face of climate change (Manns, 2014d).

3.3. ECOSYSTEM SERVICES IN THE RESEARCH AREA GDAŃSK-KALININGRAD

The research are, situated along Baltic Coastal Region in Delta Vistula and Żuławy excluding Kaliningrad is situated in Pomeranian Voivodeship.

This area is chosen as it contains different landscape types: from coastal, estuarine, riverine, agricultural to urban areas. The major urban area is the city of Gdansk which is part of Tricity. Tricity is the name of the agglomeration Gdansk-Sopot-Gdynia. Gdansk is both situated at the river as well as the sea and holds a harbour. Towards the east of Gdansk, industrial areas are situated within lower parts of the area. This low-laying area is part of the estuary of the Vistula and has been drained centuries which resulted in an open flat landscape with polders. This part is largely in use for agriculture. Along the coast towards the border with Kaliningrad the area is more natural area with dunes and the peninsula Vistula Split.

THE RESEARCH IS LOCATED IN THE VOIVODSHIP OF POMERANIA
Within the research areas there are 7 municipalities (gminas) of which Gdańsk is both the largest in land area, and the highest number of inhabitants. Following gminas belong to our research areas: Gdańsk, Stegna, Sztutowo, Ostraszewo, Cedry Wielkie, Ostaszewo, Suchy Dąb.

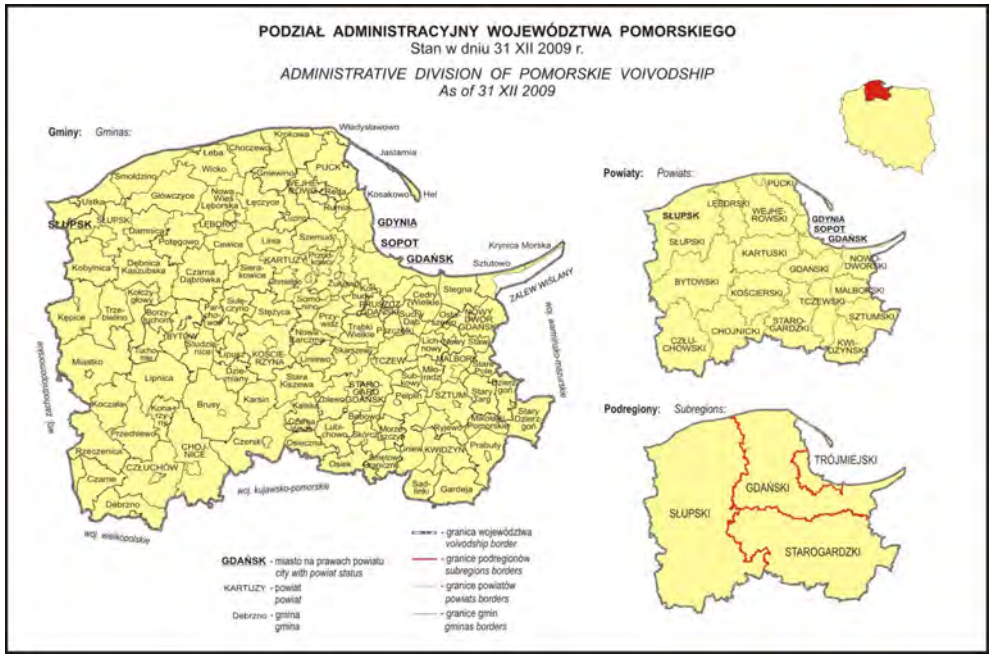


Fig. 3.2. Map with settlements and municipalities
Source: Gdańskii Urząd Statystyczny http://gdansk.stat.gov.pl/cps/rde/xbcr/gdansk/ASSETS_2010-wkladka-A-PodzialAdministracyjny.jpg

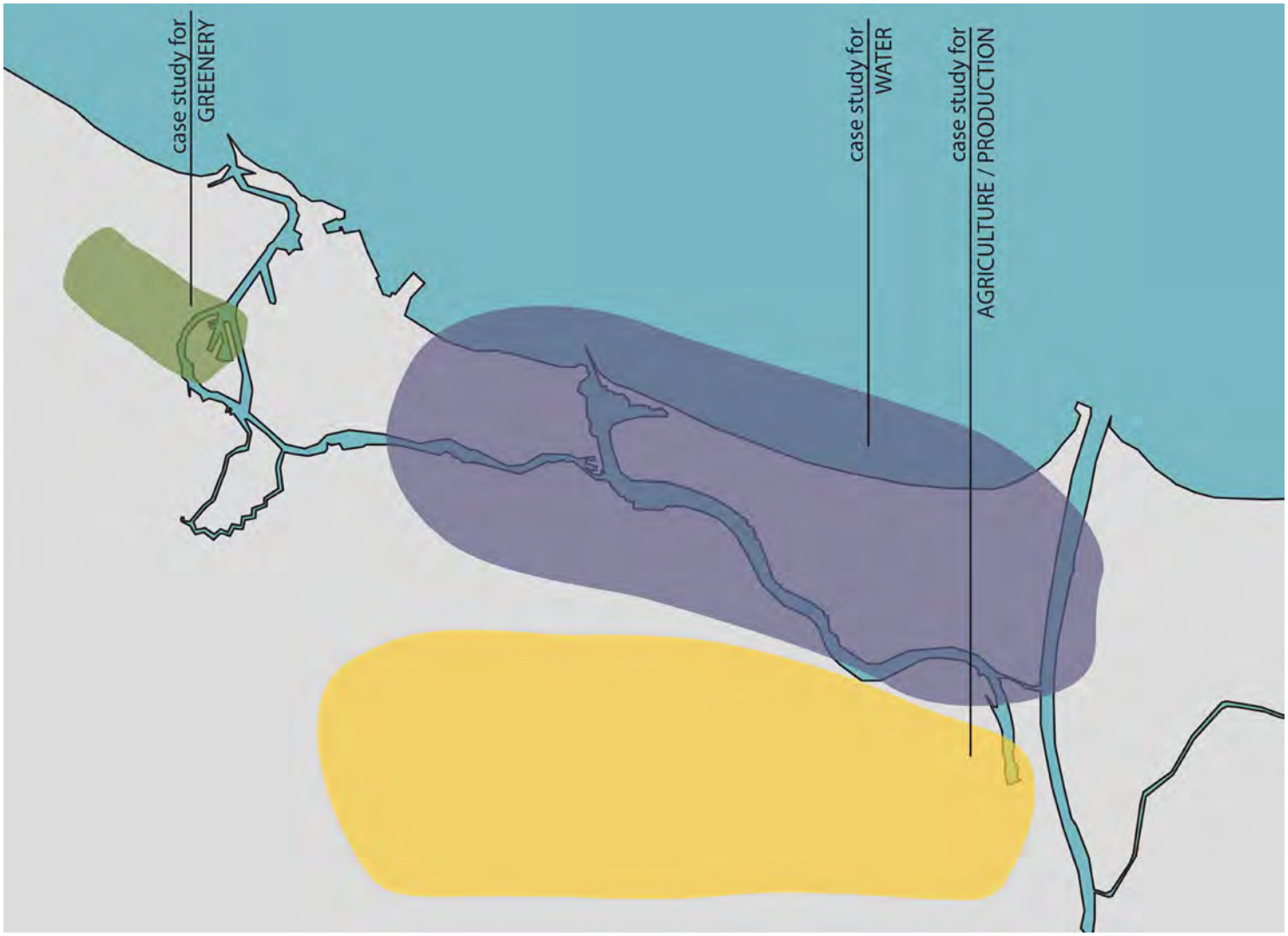


Fig. 3.3. Map of the research area
Source: based on: Google Maps, author: Justyna Król

NOW AND THEN

The landscape within the research area has changed over the years. This section gives an impression of the changes within specific areas within our research area.

AREA OF PRZEKOP WISŁY AND ITS SURROUNDINGS
Przekop Wisły, that literally translated means Vistula Dug, is an artificially created link between the Leniwka branch of Vistula with the Gdańsk Bay, near the village of Świbno.

Fig 3.4. Part of historical map of 1908 of Przekop Wisły and its surroundings
Source: Archiwalne Mapy Pomorza Gdanskiego. Available at: www.mapy.eksploracja.pl)

Fig. 3.5. Map of 2016 of the Przekop Wisły and its surroundings
Source: Google Maps

EASTERN PART OF GDANSK

Within this area lays the natural mouth of the Vistula river. The village of Stogi is situated at the central island. The village was sustained by agriculture and fishing. Later when a direct connection by the bridge Siennicki was established on June 8, 1912, the village surroundings became a popular holiday destination. Nowadays, Stogi is mainly a residential area situated in a green surroundings.

Fig. 3.6. Part of historical map of the eastern part of Gdańsk from around 1912
Source: Archiwalne Mapy Pomorza Gdanskiego. Available at: www.mapy.eksploracja.pl)

Fig. 3.7. Map of 2016 of the eastern part of Gdansk and its surroundings
Source: Google Maps

PROVISIONING SERVICES

3.3.1. FOOD, RAW MATERIALS AND MEDICINAL RESOURCES

Food production plays, in particular, an important role within the territory of Żuławy, the area within the estuary of the Vistula river. This territory has the best soils within the Gdansk voivodship (See figure XX) (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). Agriculture determines the identity of this territory, and is concerning revenues the largest economic sector (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). The good soil and climate conditions give room for cultivation of grain (wheat and barley), sugar beets, canola, legumes (beans) and high efficiency forage for cattle (corn and alfalfa) (Urząd Marszałkowski Województw Pomorskiego, 2011). Next to food produce, agricultural production has different waste materials such as straw and manure which are likely to be of use in production of other materials like construction materials or biogas.

Farms in the Pomeranian area are in general privately owned and have an average size of 16.2 ha (See Table XX) (Główny Urząd Statystyczny, 2014). Most agricultural holdings in Pomerania are however smaller, between 2 to 10 ha which is the most common size for farms in Poland (Główny Urząd Statystyczny, 2014). In 2014, 708 certified organic farms with a total area of 25 184 ha were in the Pomeranian voivodship, and another 139 farms were on undergoing conversion with a total area of 4 089 ha (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). The number of organic farms has since 2001 significantly grown as back then there were only 15 organic farms, and 10 farms in the process of converting (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). As a result, there is now a proportion rate of 3.44 of certified organic farms in relation to all existing farms. Most organic farms are located around agglomeration of Tricity, Gdansk-Sopot-Gdynia, as this is the biggest market for organic products.

Fig. 3.8. Numbers of agricultural holdings by area of agricultural land in voivodship
Source: Główny Urząd Statystyczny, 2014

Territorial unit	up to 1 ha	over 1 ha and less than 2 ha	from 2 to less than 5 ha	over 5 and less than 10 ha	from 10 to less than 15 ha	from 15 to less than 20 ha	to 20 ha	over 20 and less than 30 ha	over 30 and less than 50 ha	from 20 to less than 50 ha	50 ha and more	from 30 to less than 100 ha	100 ha and more
	total	total	total	total	total	total	total	total	total	total	total	total	total
	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013
	[-]	[-]	[-]	[-]	[-]	[-]	[-]	[-]	[-]	[-]	[-]	[-]	[-]
POLAND	34.375	277.572	455.268	315.227	141.295	70.203	1.293.940	62.511	40.735	103.246	31.820	20.743	11.077
Northern region	2.601	17.461	27.932	20.556	22.137	13.692	114.379	13.538	10.502	24.040	8.579	5.623	2.956
POMORSKIE	727	5.037	8.661	8.478	6.019	3.265	32.187	3.155	2.367	5.522	2.247	1.383	864

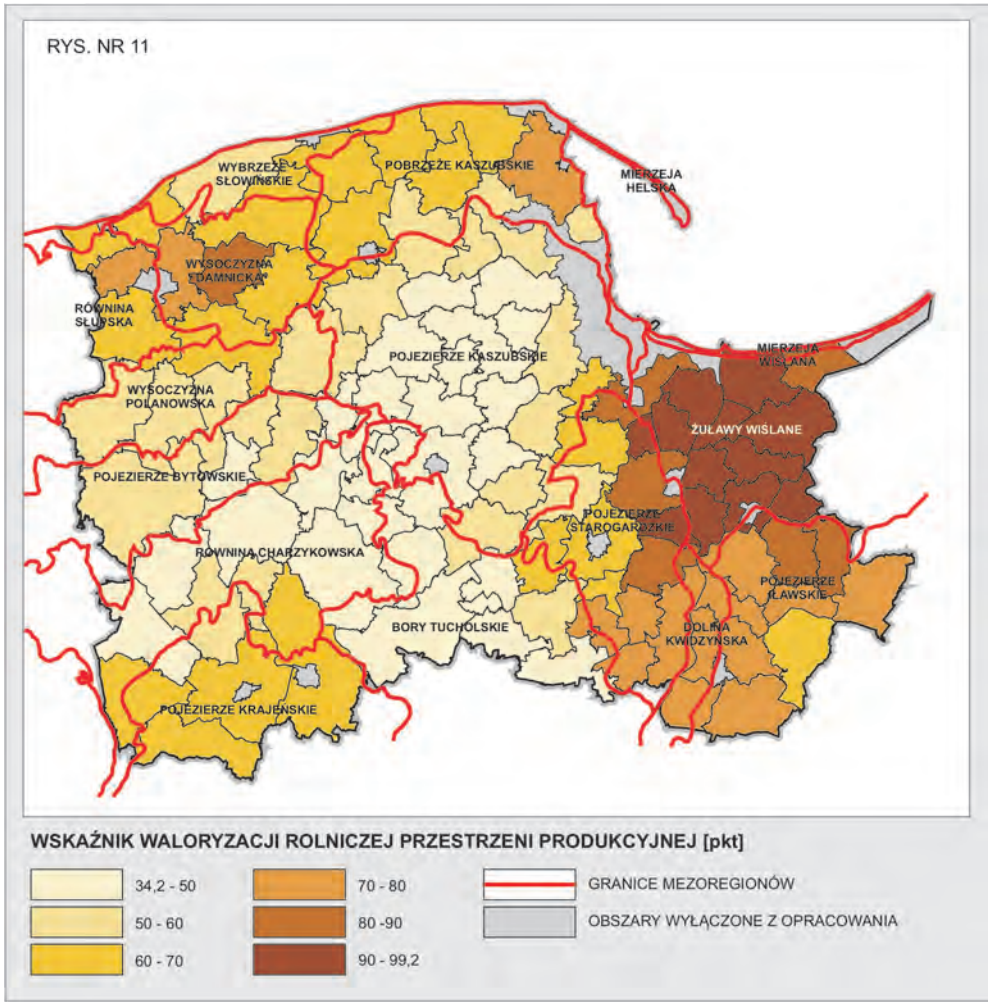


Fig. 3.9. Numbers of agricultural holdings by area of agricultural land in voivodship
Source: Główny Urząd Statystyczny, 2014

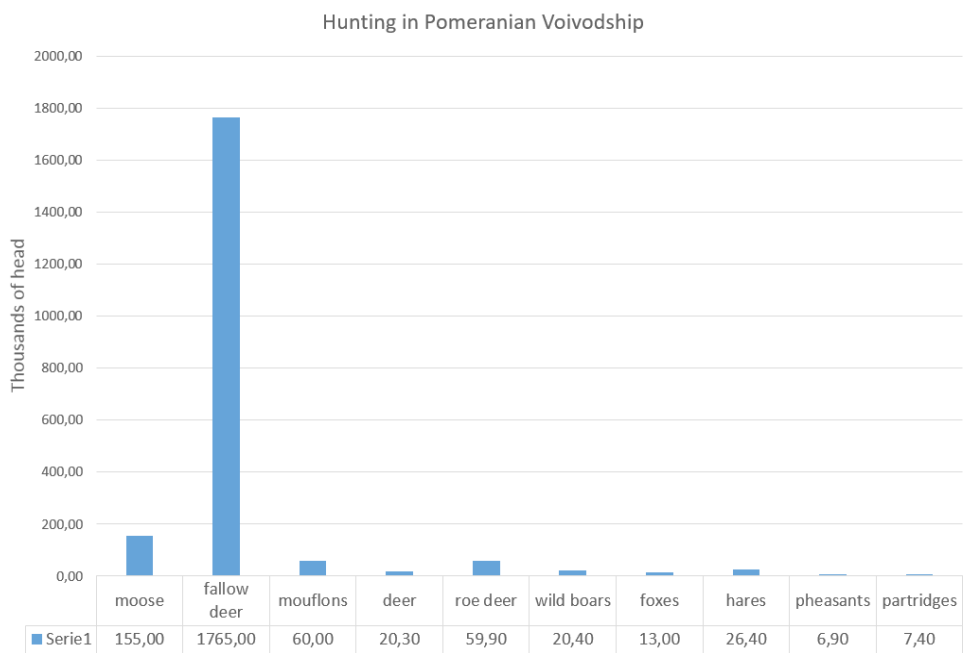
The proximity of the sea and the presence of rivers and lakes provide possibilities for extensive and intensive fishery. Within the region, there are several prospering fishing companies. Alongside the more traditional sea fishery, intensive fish breeding has been developed inland which is mainly breeding rainbow trout for export to foreign markets (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). The inland fishery is a water-consuming business with 1 ha of water tanks to 40-50 kilos of fish (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000).

Recreational fishing is popular activity in Poland, and more recreational fishing spots are being developed. It is very easy to spot sportfishers lining up bigger and smaller embankments around Żuławy, even in Gdańsk, during weekends and holidays. Thanks to more facilities being opened for fishing lovers, attractiveness of region rises. Another popular pastime is to pick up mushrooms and berries. For most people, this provides, next to recreation, additional food supplements to themselves and their families. It also provides small, additional income to the households, as people selling berries and mushrooms can be spotted on the edges of roads and on small markets. However, larger businesses also play a part in picking up mushrooms and berries. Fig. XX shows the amount of forest fruit and mushrooms produced in tons in the Pomeranian voivodeship. Hunting is another recreational sports within the Pomeranian region. Within the Żuławy region, there are a number of hunting societies. Hunting is however also done as a measure to control populations and to control damage.

Fig. 3.10. Numbers of forest fruit and mushrooms produced in Poland and Pomeranian voivodship in tons
Source: Główny Urząd Statystyczny, 2014

Territorial unit	forest fruit		mushrooms	
	quantity	value	quantity	value
	2014	2014	2014	2014
	[t]	[thous. zł]	[t]	[thous. zł]
POLAND	9 472	67 374.7	3 215	64 563.8
Northern region	2 485	20 142.9	1 206	14 669.6
POMORSKIE	2 211	19 354.4	1 122	13 446.6

Fig. 3.11. Hunting statistics per game animal for the Pomeranian voivodeship
Source: Główny Urząd Statystyczny, 2014



Wood was the historically building material for Żuławy houses and huts. For the roof coverings mostly hatched reed was used, only rarely with rye straw. Bricks were used for construction (Stowarzyszenie Konserwatorów Zabytków, 2005) as rock was lacking in this area. Only later rocks were imported (Lokalna Grupa Działania Żuławy i Mierzeja, 2009). Nowadays, the Żuławy territory is still producing timber, though not in large amounts as wood production forests are limited (See figure XX) (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). In the forested area of Stegna, plots are leased by the State Owned Forests to a large number of tourist facilities (Mariusz Kistowski, 2006). Wood production would cause an increase in traffic on forest tracks (Mariusz Kistowski, 2006), and with the presence of numerous protected species, animals and plants, in the area, wood production and collection of other raw materials is limited (Pomorskie Parki, 2016).

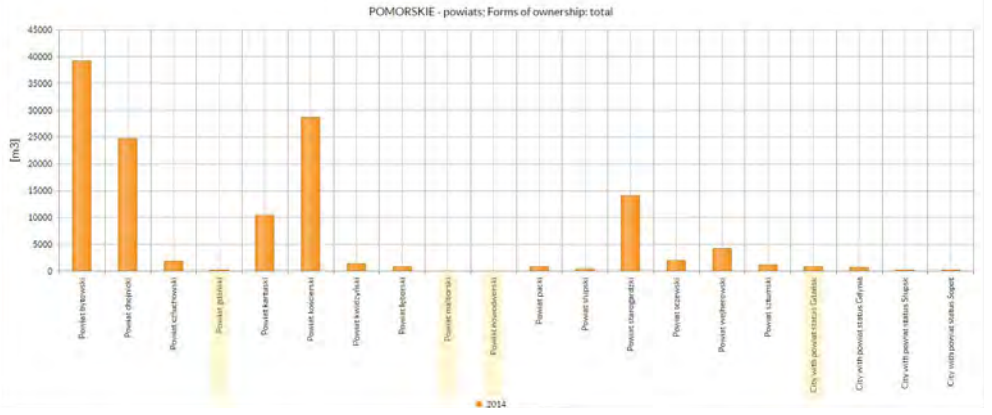


Fig. 3.12. Timber removals in Pomeranian voivodship in m3
Source: Główny Urząd Statystyczny, 2015

An organic materials are also found in the Pomeranian region. Clayey raw materials are mined and processed for the production of lightweight aggregates and building ceramics (Pomorski System Monitoringu i Ewaluacji, Wirtualny Atlas Pomorza). Important for the development and expansion of the Tricity agglomeration is the discovery of natural gas and crude oil deposits along the south-eastern Baltic Sea coast which are being exploited by Gdansk refinery (Mariusz Kistowski, 2006). Amber is also found in the Wiślinka region near Gdańsk. This resource is, however, not exploited.

Eutrophication is one of the major environmental issues in the Baltic coastal region(Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). Eutrophication is when the ecosystem gets enriched with chemical nutrients, usually components containing nitrogen, phosphorus, or both. Within our research area, especially the western part of the Vistula's delta is considered as highly eutrophic (Uwarunkowania przestrzenne rozwoju obszarów wiejskich, 2000). Agriculture is considered to be the major cause of eutrophication. This problem is associated with excessive usage of mineral fertilizers as well as intensive application of organic ones from cattle (Ongley, 1996). Eutrophication is a very complex problem which needs solution on many levels. Especially in Poland where agriculture makes up a large part of the country's economy, and policies are ensuring it stays this way, innovative solutions in collaboration with agriculture are necessary.

PROVISIONING SERVICES

REGULATING SERVICES

3.3.2. FRESH WATER AND WASTEWATER TREATMENT

Where is the water from Gdansk and Zulawy coming from? Where is it cleaned? Is it cleaned? Or dumped in the Baltic Sea? That the two mentioned rural municipalities do not have large issues is to be expected, but what about the bigger city?

In the smaller municipalities along the coast, like Krynica Morska and Sztutowo, potable water is mainly provided from deep-water intakes from aquifers, respectively 95,5% and 98% is provided from aquifers. In these two municipalities, 2 to 4.5% of the potable water is still coming from individual wells. The water quality fulfils the appropriate norms and regulations with 97% for physicochemical parameters, and 100% for bacteriological parameters. As the request does not surpass the intake in these coastal, there are no problems with the fresh water supply. Most municipalities along the coast have a joined sewage plan in which a sewage treatment plant in Stegna municipality gathers the sewage from the joined municipalities. The municipality of Krynica Morska has two wastewater treatment plants of its own; one in Piaski and one in Krynica Morska. The latter is currently undergoing modernization and expansion.

Fig. 3.13. Transit system of treated waste-water
Source: www.sng.com.pl

3.3.3. MODERATION OF EXTREME EVENTS AND EROSION

REGULATING SERVICES

Flooding has always been part of the Vistula delta as are the measures people took to control these floods. One of the large defence constructions was the construction of the trench of the Vistula river in 1985. Unfortunately, this did not help to decrease the threat due to ice jams blocking the trench (Cebulak, 2010). Within the last decades, risk of floods and the frequency of floods increased in Poland. This increased risk is especially apparent in the valleys of the larger rivers such as of the Vistula river. In 1983 and 2009, the Żuławy region has been haunted by floods resulting from storms, and in 2011 from rainfall (Kistowski, 2011). Figure XX shows the areas in the Vistula estuary which are at risk of flooding. As Kistowski (2011) points out, the new program "2030 Complex Flood Protection" increased the knowledge on planning for water management, and in particular on sustainable flood protection. Yet, without particular legislation connected to spatial management, the possibilities of reducing flood risks are still limited (Kistowski, 2011).

Part of the Polish coast is protected by natural dunes preventing it from flooding. From the 700 km Polish coastline, only along 15%, or about 100km, of coastline the process of dune accumulation takes place (Labuz, 2013). In our research, the coastline is about 66km of which 19km has dune accumulation processes. Furthermore, this area has faster dune increase rates than the rest of the Polish coastline. The accumulation of sand is most effective during heavy storms in spring and winter (Labuz, 2009). Yet, when ice jams occur in winter, no sand accumulation takes place and it can cause coastal dune retreat. Moreover, ice jams can damage piers and other structures that function as coastal protection (Labuz, 2013). Storms can also have a negative impact on dunes as waves can increase coastal erosion (Labuz and Grunewald, 2007). Especially, when with the sea level rise the water will rise 1m, the more likely waves will erode the dunes (Labuz, 2009). Currently, the Vistula Sandbar is susceptible to storm surge flooding (Labuz, 2013). Human development also threaten the dunes and its natural vegetation by tourism pressure; building new hotels and shops along the coast, and walking and cycling paths in the dunes (Labuz and Grunewald, 2007). Luckily, tourism is still limited in the research area (Labuz and Grunewald, 2007).

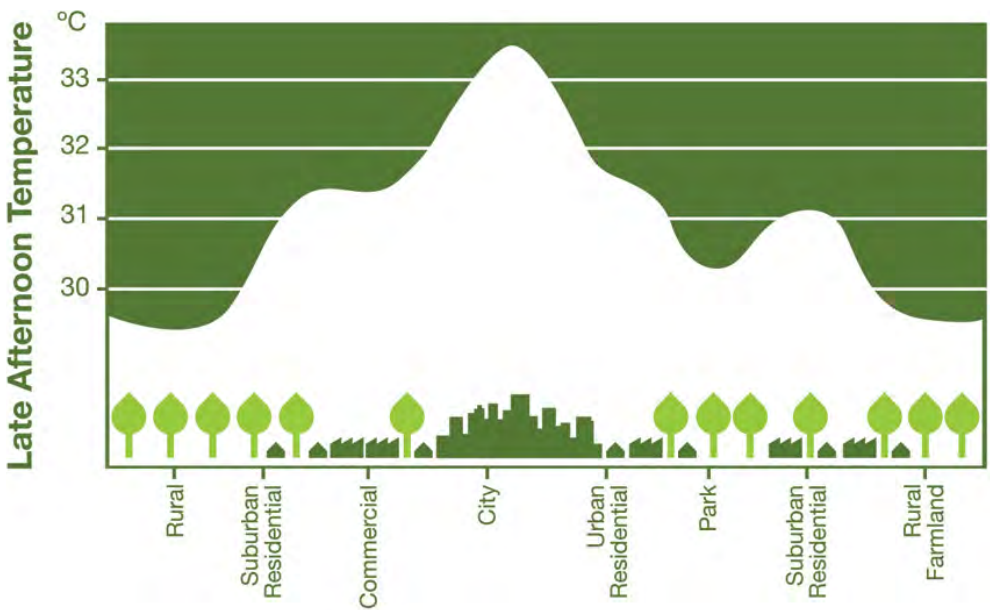
REGULATING SERVICES

3.3.4. LOCAL CLIMATE AND AIR REGULATION AND CARBON SEQUESTRATION AND STORAGE

The proximity of the Baltic Sea has a profound effect on the local climate of Baltic coastal regions by providing cool sea breezes. Basically, sea breezes are caused by air circulation. During warm days, land heats up faster than sea water. While the h eated surface air above land rises, cool air from offshore is drawn inland. Usually, such a sea breeze is only effective a few kilometres from the coast, but over open, flat areas like Żuławy the effect is extended (Enviropedia, n.d.). The same breeze effect can occur on a smaller scale near rivers and lakes where water is cooling down adjacent pieces of land.

In urban area, such as Stogi and Gdansk, temperatures are often higher than in the surrounding rural areas (Voogt, 2004). This phenomenon is called the "Urban Heat Island" or in short UHI which is caused by (electric) appliances radiating heat and the use of hard (and often dark) materials like glass, concrete, stone, and asphalt for pavings and buildings. These materials soak up the heat from the sun during the day, and release the accumulated heat during the night (Enviropedia, n.d.). UHI can have a significant impact on city inhabitants; on their human comfort (positive in winter, negative in summer), on energy use (positive in winter, negative in summer), on air pollution (negative), water use (negative), and on biological activities such as the extension of the growing season (positive) (Voogt, 2004). The UHI is one of the examples of how humans unintentionally change the climate simply by changing surface characteristics. Factors that contribute to the intensity and occurrence of the urban heat island effect are: weather, geographic location, season, city form and functions (Voogt, 2004).

Fig. 3.14. Urban Heat Island effect
Source: healthyurbanhabitat.com.au



The proximity of the sea and the presence of river through the city, helps Gdansk to keep cooler. Also the canals of Motława and Old Motława, contribute to the ventilation of the inner city. Sea breezes are luckily able to penetrate deep into the city as there are few storey buildings to block them. These breezes can also help to reduce the air pollution in the city if the breeze runs through the whole city area. Air pollution occurs mainly in Gdansk due to exhaust fumes and burning fossil fuels by traffic and industry. Figure XX shows that most air pollution problems occur around the centre where most traffic takes place.

Fig. 3.15. Indication of the air Pollution in Gdansk and surroundings by the Real-time Air Quality Index Visual Map
Source: World Air Quality Project. Available at: http://aqicn.org/map/poland/#@g/54.3465/18.9402/10z. [Accessed: 13th April 2016 12:00]

REGULATING SERVICES

3.3.5. POLLINATION AND BIOLOGICAL CONTROL

In moderate climate zones, insects pollinate over 80% of plants, of which a large part are agricultural crops (Regionalna Dyrekcja Ochrony Środowiska w Gdańsku. 2015). If bees and other pollinators disappear, this would cost Poland millions and would affect the national economy. The value of pollinators includes not only the pollination of crops, but also the bee products itself which accounts for about a tenth of the bees´ worth for the Polish economy (GD, 2012). Unfortunately, bees are already in decline in Pomeriana. About 30% of the bee population died in the winter of 2011/2012, partly due to weather conditions yet also diseases (GD, 2012). In addition, the general trend is that the number of hives is declining in Poland and also Pomerania. At the end of 2000, the amount of beehives in Pomerania was 36 thousand, while in 2011 only 33.6 thousand were left (GS, 2012). This is not a dramatic reduction, yet it indicates a trend.

The monoculture of crops also contributes to the reduction of the bee population as well as other pollinators and biological control agents. Insects need diversity in the landscape and not areas of 100-200 ha of canola (rape) with nothing else around it like in Żuławy (GD, 2012). To improve pollination and biological control, and increase the number of beneficial insects, the environments needs to become of a higher quality and more diverse. More diverse means that a larger variety of crops need to be produced in an area as well as introducing more landscape elements as hedges, trees, flower strips, and small scale forests. Such measures do not only benefit insects, but also small mammals and birds. In addition, shelter can be provided to bees. For instance, the red mason bee usually nests in holes in old trees and bee hotels and creates small colonies there (Roberts and Dean, 2010). Important then is to leave old trees or put bee hotels.

Within our research area, the most important pollinators are:

The western honey bee, also known as the European honey bee – this bee is very social and lives in large colonies. In average, one hive yields around 22.5 kilograms of honey. To produce 0.5 kilogram of honey, they need nectar from millions of flowers (Bugfacts.net, 2008-2015).

Fig. 3.16. Photo of the western honey bee
Source: treknature.com

The red mason bee (Latin name: Osmia rufa/Osmia bicornis) is a very familiar and distinctive spring-flying solitary bee which could be spotted in gardens, parks and allotments. This kind of bee is very keen on using bee hotels which provide good nesting opportunities (Roberts and Dean, 2010).

Fig. 3.17. Photo of the red mason bee
Source: www.wildbienen.info

The buff-tailed bumblebee or large earth bumblebee (Latin name: Bombus terrestris) do not live in swarms, but in small nests. They produce enough honey to feed their offspring (Bugfacts.net, 2008-2010)

Fig. 3.18. Photo of the buff-tailed bumblebee (Source: www.howardianlnr.org.uk

3.3.6. TOURISM, RECREATION AND PHYSICAL AND MENTAL HEALTH`

What about tourism in Gdansk? What about tourism in Zulawy? What about recreation? What can people do here in their free time?

It´s location at the sea makes the Baltic coastal region particularly attractive for tourism. Within the Pomeranian region, there's no doubt that dunes and beaches play a fundamental role as attractive destinations throughout the year. Within the research area, tourism is however more small-scale and more extensive. This is probably partly due to the nature reserves of the Vistula Split Landscape Park which restricts intensive development. There are two highly attractive Nature Reserves: "Buki Mierzej Wislanej" and "Rezerwat przyrody Katy Rybackie". The latter is created for the protection of both cormorant and gray herons.

Furthermore, the Vistula Spit attractiveness also resides in the culture around it, with a legacy going back to the 13th century and the Teutonic order that once dominated the region. Altogether with the sandy beaches; different water activities that can be done within the Vistula Spit; and the sightseeing of a rich wildlife, the estuary has become an attractor for visitors both for its natural beauty and it's fascinating history.

3.3.7. AESTHETIC APPRECIATION, SPIRITUAL EXPERIENCE, SENSE OF PLACE, AND INSPIRATION FOR CULTURE, ARTS AND DESIGN

Within the area are some typical landscapes. Most remarkably, and also typical, for the southern Baltic coast is the peninsula Vistula Split. This peninsula is a long stretch of land of mainly dunes and forests which separates the Baltic Sea from the delta lake Drużno. Drużno is a very unique landscape and one of the two river delta lakes in Poland. The lake has a low depth, about 3 to 3.5 metres and low, swampy vegetated shores. Since 1967, Drużno lake has been national park and a habitat of water and swamp birds.

Fig. 3.19. Map of Delta with Drużno Lake circled
Source: https://upload.wikimedia.org/wikipedia/commons/thumb/e/e8/Dru%C5%BCno_Druzno_Lake.png/260px-Dru%C5%BCno_Druzno_Lake.png

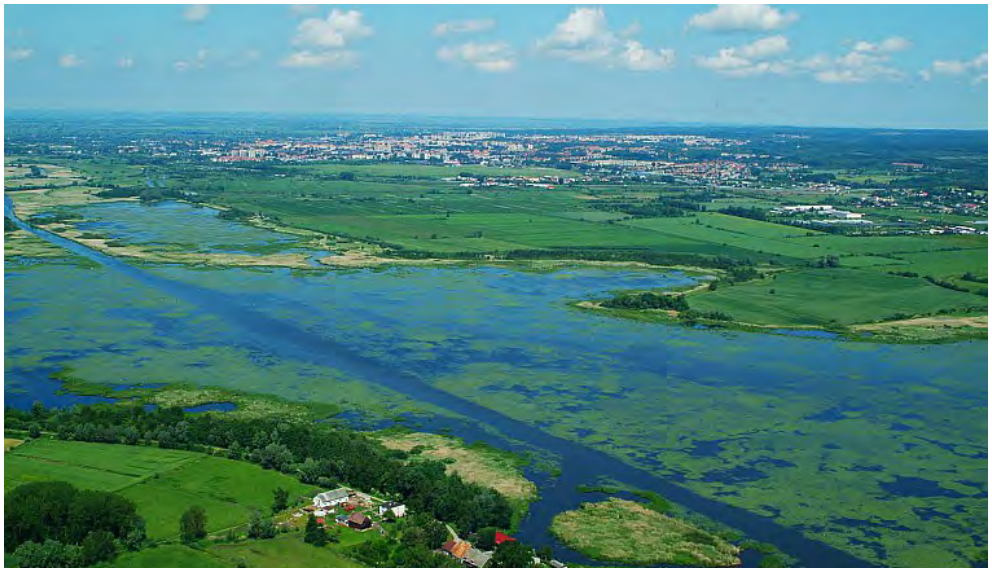


Fig. 3.20. Aerial photo of the delta Lake Drużno
Source: http://www.elawolny.com/wp-content/uploads/2011/07/Jezioro-Dru%C5%BCno.jpg

Another feature that dominated the landscape is the estuary of the Vistula river. The river is now largely canalised and during time changes have made to change the course and the mouth for flood protection and water transport.

Fig. 3.21. Aerial photo of the Vistula's delta
Source: Wczasy z psem Available at: www.wczasyz-psem.com

Fig. 3.22. Aerial photo of Vistula's delta and adjacent fields which are bordered by trees
Source: Wcyasy z psem Available at: www.wczasyz-psem.com

The Żuławy area is mostly flat and open with a well-developed drainage canals system required for agriculture. This resulted in rectangle shaped fields bordered by drainage canals. The fields show a very characteristic way of ploughing- the field appears to have two slopes with the ridge in the middle which allows water to go straight to drainage canals (Buczkowski, P. 20xx). There is a lack of balks which are unploughed ridges to prevent soil erosion or mark a division on common land (thefreedictionary, n.d.). Trees are planted along drainage canals and roads, and on the midfields and on the edges of roads.

Fig. 3.23. Photo of Żuławy landscape showing the characteristic division of fields with willows and the yellow blooming colza which is a popular crop
Source: Bogdan Groth Available at: https://upload.wikimedia.org/wikipedia/commons/1/18/%C5%B-Bu%C5%82awy_Gda%C5%84skie_okolice_Steblewa.jpg

Żuławy is also a very popular destination for open-air painting and is widely recommended by painters to other artists on internet forums. Popular topics of Żuławy depicted in art are its architecture, agricultural landscape, and sunsets.

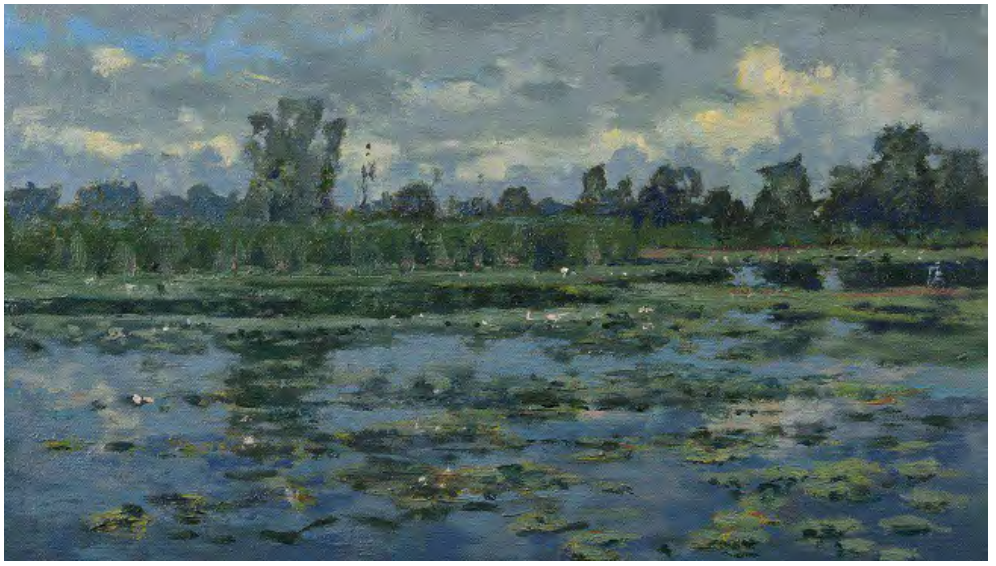


Fig. 3.24. "Pochmurne Żuławy" ("Overcasted Żuławy") by Wojciech Górecki, 27x44cm oil on canvas. The could be taken at showing one of Żuławy's backwaters
Source: www.touchofart.eu

Fig. 3.25. "Żuławy kanał" ("Żuławy canal") by Wojciech Górecki, 50x70cm oil on canvas. The painting shows a draining canal between two fields with in the background the gable walls of Żuławy houses
Source: www.touchofart.eu

Fig. 3.26. "Żuławskie przestrzenie" („Space of Żuławy") by Teresa Bekier, acrylic on canvas. The painting shows the typical flat landscape with the river
Source: galeria-essey.pl

HISTORY

Originally, the area was heavily forested. From 14th century, the process of deforestation began (Buczkowski, P. 20xx). One of the earliest settlements was the Baltic harbour called Truso in the 9th century, situated on the east shore nearby the present village of Janów (Buczkowski, P. 20xx).

In 16th century, the Netherlands was going through difficult times due to long and costly wars with Spain. At the same time, Protestant Christianity was spreading around the country and started to persecute other faiths. At that time, many Dutch decided to leave the country to find a new home, where they could perform their faith freely Głuszek, n.d.). At that time, Poland, or back then the Polish-Lithuanian Commonwealth, was multicultural and very open minded. The Dutch choose the Vistula's delta area. Local inhabitants and Gdansk authorities welcomed the Dutch and their knowledge and skills of flood protection and offered them a place to live in exchange for help in draining the area. In particular, as local knowledge lacked and at that time two huge floods happened within a time span of three years (Głuszek, n.d.).

Alongside the Dutch, Olenders how Polish called them, a special group of settlers lived in Żuławy; the Mennonites. The Mennonites were members of Anabaptist sect founded by Menno Simons (1496-1559) and had to leave their native Frisia as a result of religious persecution. Their society was characterized by strict social mores based on the observance of the Ten Commandments, discipline, and order for public participation in community life. They were also known for the rejection of infant baptism in favour of adult baptism, the prohibition of oaths, agreeableness and pacifism. The Polish authorities considered them to be excellent farmers and exemplary peaceful citizens. Therefore, the Polish authorities always respected their distinctiveness including the right to refuse military service. These liberties ended in the Prussian partition after which many Mennonites emigrated to other areas in particular to the United States. Those who stayed, were assigned to the municipalities of the Evangelical-Augsburg, Germanized in subsequent generations, and finally shared the tragic fate of all Pomeranian Germans at the end of World War II - murdered or at best cast out from their homes (Głuszek, n.d.).

Another era that played an important role in the history of the area is 1900-1945, in particular the years during WWII. In September 1939, the Germans established the Stutthof camp in a wooded area west of Stutthof (Sztutowo), a town about 22 miles east of the city Danzig, nowadays Gdansk. The camp was situated along the Danzig-Elbing highway on the way to the popular Baltic Sea resort town Krynica Morska. Tens of thousands of people, perhaps as many as 100,000, were deported to the Stutthof camp. The prisoners were mainly non-Jewish Poles, yet there were also Polish Jews from Warsaw and Bialystok, and Jews from forced-labour camps in the occupied Baltic states which the Germans evacuated in 1944 as Soviet forces approached. Many prisoners died in the typhus epidemics that swept the camp in the winters of 1942 and 1944. Those whom the SS guards judged too weak or too sick to work were gassed in the camp's small gas chamber. Gassing with Zyklon B gas began here in June 1944. In addition, killed sick or injured prisoners were killed by camp doctors in the infirmary with lethal injections. More than 60,000 people died in the camp (United States Holocaust Memorial Museum, n.d.). In 1945, when the German troops were pushed away from Polish territory, they destroyed and demolished the anti-flood embankments, the water reservoirs and the water pump systems. All lower areas and valleys in the Vistula delta were flooded and became unsuitable for agriculture. After the war, the area was mainly populated by people from the former eastern polish territories such as the west part of current Belarus. They started the long process of drying the soil and rebuilding the drainage canals system (Buczkowski, P. 20xx)

The long history of human settlement and the different groups and events in the area left their marks and remains in the area. Of the Olenders, or the Dutch, is still much heritage present and form characteristic elements in the cultural landscape. The Olenders, for instance, build typical arcaded houses, and their homesteads were often buildings with the living quarters is connected with farm buildings in the typical shapes of the letters I, L and T. Another typical hallmark of the Olenders were fences of woven willow branches which were designed to impede the water flow during floods and stop the fertile silt. These fences can still be found in the valley of the Vistula.(source: Górka A., Zagroda; Zagadnienia planowania i projektowania ruralistycznego, Gdańsk 2011). From the Mennonites still remains the cemeteries which are typically assembled on terps. The Stutthof concentration camp is turned into a museum and memorial place for all the people that died in here.

Fig. 3.27. Typical arcaded Olender house in Trutnowy
Source: www.polskiekrajobrazy.pl

Fig. 3.28. Cementery in Szaleniec
Source: http://pomorskie.travel/web/uploads/wpisy/miniatury/L-3110ceabec4971d7fdab0fcb-5894c29eeb81f745.jpg

3.3.8. HABITAT

SUPPORTING SERVICES

There are three environments that have outstanding natural qualities and are valuable objects for ecological preservation.

THE DUNES IN GÓRKI ZACHODNIE
This 1,69ha large dune area, located on Stogi Island, holds the largest dunes in the area of Gdansk. Górki Zachodnie is a unique habitat for birds, and a place in several valuable and rare species can be found.
The area holds a particular diverse flora with the following plants under protection and semi-protection plans:

- Common Polypodium (Latin name: Polypodium vulgare). Status: protected. This plants´ rhizome is used in herbal medicine, as well as in cooking. The roots have been found to be 500 times sweeter than sugar.
- Swedish whitebeam (Latin name: Sorbus intermedia). Status: protected. This tree species comes from southern Sweden, and scattered around the Baltic region where it typically grows in in forests and pastures.
- Sand sedge (Latin name: Carex arenaria). Status: semi-protected. This grass is commonly found in dune areas. It has medicinal properties with low toxicity rates, yet nowadays is almost not used for this purpose.
- Alder Buckthorn (Latin name: Rhamnus frangula. Status: semi-protected.

ZIELONE WYSY W GORKACH ZACHODNICH (insert images)
This e 33,46ha area, with ecological usage status, is the one of the largest areas high value ecological areas of Gdansk. Górki Zachodnie is a unique habitat for birds, and a place in which valuable and rare species can be found.

Furthermore more than 86 species are found under the national species protection regulation, among the most valuable ones we can find:

- Tringa totanus (common redshank).
- Migratory species that cross around Eurasia, most commonly found around the Mediterranean and the Atlantic coast. And it's protected under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds.
- Vanellus vanellus (northern lapwing or peewit).
- Also protected species under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds.
- Motacilla citreola (citrine wagtail).
- Also protected species under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds.

KARASIOWE JEZIORKA
The 38,91ha area, with ecological usage status, is the one of the largest areas high value ecological areas of Gdansk.

In the area, quite specific and rare species of plants are found, both forest, aquatic, wetland biotopes and reed beds. Some of those plants are among risk of extinction in Poland, and are increasingly rare in the Pomeranian region:

- Dactylorhiza maculata (heath spotted-orchid);
- Carex brizoides;
- Carex praecox;

- Ophioglossum vulgatum (adder's tongue).

As well, several valuable animal species that are in risk of extinction in the country can be found on the area:

- Hirudo medicinalis (medicinal leeches);

The species, scattered by collectors during the 19th century for its medicinal use, is now facing the problem of the reduction of their natural habitat (muddy freshwater pools and ditches).

- Breeding birds;
- Accipiter gentilis (northern goshawk).

Northern goshawks are powerful hunters that can help in the control of other populations in the ecosystems they inhabit. Although present in several parts of Europe and North America, the northern goshawk is often categorized as a threatened species due to the loss of their habitat that they face through the clearing of the forests in which they inhabit.

- Podicipedidae (grebe);
- Gallinula chloropus (swamp chicken);
- Dryocopus martius (black woodpecker);
- Muscicapa striata (spotted flycatcher).

4 DESIGN GUIDELINES

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4. DESIGN GUIDELINES

The knowledge gathered for and presented in previous chapters can play a more significant role when put into practice. For this reason, design guidelines have been prepared. These design guidelines are meant to help designers and urban planners to implement solutions that support ecosystem services, and at the same time improve the sustainability of their spatial designs.

The guidelines are divided into three categories: GREENING THE URBAN STRUCTURE, PRESERVING COAST AND WATER and PRODUCING A SUSTAINABLE FARMLAND. Based on our analysis of the research area, we indicated that these three areas each have their own typical environmental issues and characteristics.

GREENING THE URBAN STRUCTURE is about the urban area where the major challenge is to make the city more healthy and livable for people and nature. This means tackling with air pollution and urban heat island effects, and also the implications of climate and allowing room for different species of animals.

PRESERVING COAST AND WATER is about the environmental issues relating to the coastal zone and riverine landscapes, and in particular the design guidelines focus on flood protection measures, and how to improve the water quality.

PRODUCING A SUSTAINABLE FARMLAND is about shaping a farmland that is better able to provision several services, instead of only food provision. Important is to think how agricultural areas along the Baltic coast can contribute to a more sustainable and future-proof environment.

Feel invited to read the guidelines, and start implementing the ecosystem services solutions into real life!

4.1. GREENING OF URBAN STRUCTURE

4.1.1. URBAN AGRICULTURE

Urban agriculture concerns the production of food and materials within urbanized areas. This concept supports sustainable development of cities as it contributes to the self-sufficiency of cities (Deelstra and Girardet, 2000). Urban agriculture spaces can vary in size and production purpose. They may serve only the local community, or it might concern an urban farm that sells food to urban residents (Mougeot, 1991). There are numerous examples of community gardens that are managed by organised groups of people. Sometimes these places serve certain recipients for instance neighbours, but they can also be open to everyone who is willing to participate in gardening.

In Poland and many other countries, the idea of urban agriculture cannot be considered as a new idea. In many cities, allotment gardens are very common; there are about 966 000 of allotment gardens in Poland (Centrum Badania Opinii Społecznej, 2012). The Polish tradition of allotments exist already for more than 120 years (PZD, n.d.), and they are still very popular. According to a research study held in 2012, around 17% of adult Polish people are enjoying allotment gardens (Centrum Badania Opinii Społecznej, 2012). Most of these allotment gardens are however private, and not accessible to a greater public. Furthermore, cities are no longer offering new plots for allotments despite the trend of urban agriculture. New places, therefore, need to be explored.

Urban agriculture gardens appear nowadays in disused areas, within courtyards, and even on rooftops. Crops may be sown in planters or directly in the soil depending on the given space and quality of soil. As contaminated soil can be unhealthy in cultivating edible plants, it is good first to check soil qualities, especially in cities. Next to food and material provision, urban farming can help to improve microclimate, water management, nutrient recycling, the O2-CO2 balance, and to minimise waste in cities. In addition, urban gardening offers recreation, mental and physical health and can raise the environmental awareness of city inhabitants (Deelstra and Girardet, 2000).

Ecosystem services:

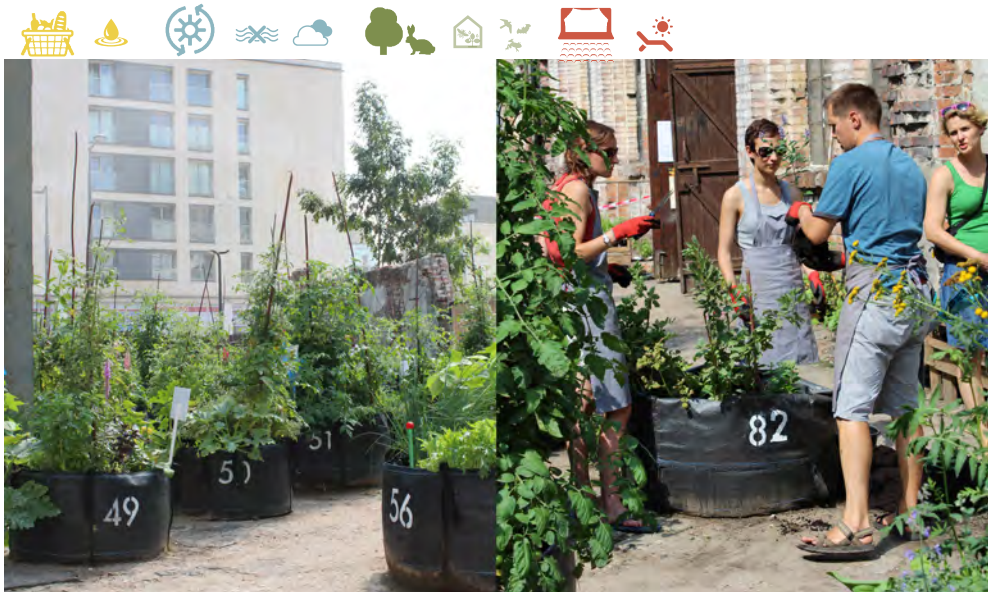

Fig. 4.1.1. Urban Agriculture "Miasto Ogród", Warszawa. Source: Anna Janus

4.1.2. CREATE GREEN INFRASTRUCTURE

In the 21st century, we understand the importance of greenery for city life. Greenery provides many benefits such as room for relaxation, playground for children, improve air quality, decrease urban heat island, and offer habitat for urban dwelling animals and plants (Ayre, 2012). Yet to make greenery more effective, it is important to connect green areas in a city into one structure. This system is made up of larger areas and connections. The larger areas can be lakes, agricultural fields, urban farms, parks, allotment gardens, and others. The connections between the different green areas can be for instance waterways with eco-friendly edges, tree lanes, green roofs, or even routes made of potted plants. (European Commission, 2013). These connections also connect the city ecosystems with the rural ones. Such connections can be made by green corridors.

A green connected structure allows animals and plants to feel more comfortable in the city, increase their habitat, and migrate easier and can help in such a way to the biodiversity in a city area. (Natural England, 2009). With a green structure also a more walkable city can be created by adding bike lanes and footpaths in the structure. This means that a better slow transport network can be realised which is likely to persuade more citizens to move on foot and bike than by car. The green structure therefore results in a city with a good air quality due to lower fuel consumption and more plants to remove pollutants from the air (Natural England, 2009).

Ecosystem services:

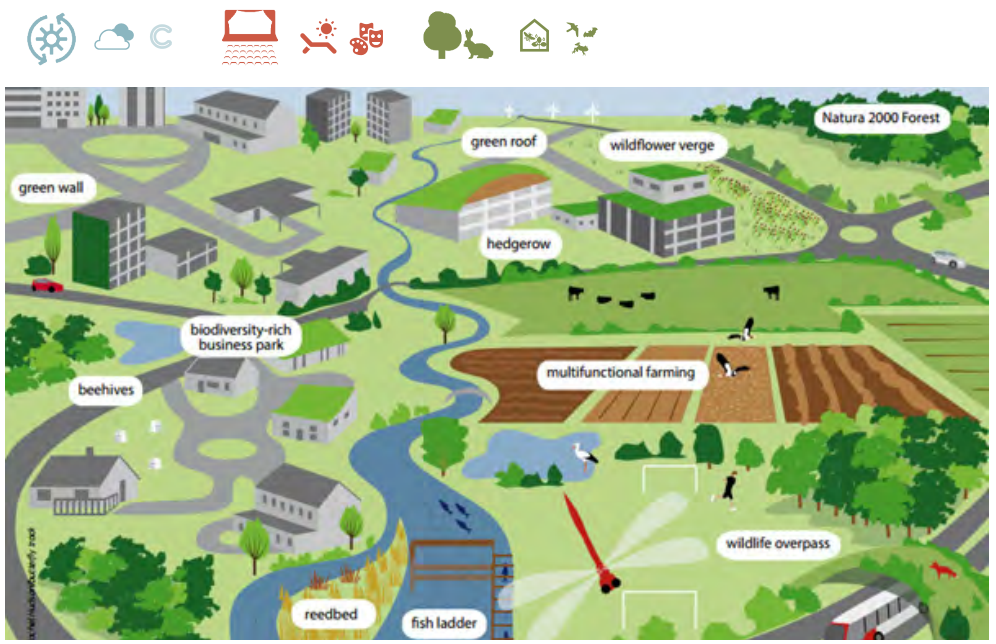

Fig. 4.1.2. Green Infrastructure in city.
Source: European Commission, 2013. Building a Green Infrastructure for Europe

4.1.3. DESIGN POCKET PARKS

Pocket parks, so called mini-parks, are green public spaces on limited plot size (Blake, 2013). Usually these parks are no larger than 0.4 hectares (National Recreation and Park Association. 201x). Pocket parks can be designed in highly urbanized areas- like space between office spaces where they provide resting place during work, a meeting place or just a place for lunch. These parks can be created on a single vacant building lot or on small forgotten spaces. The main purpose of a pocket park is to act as a scaled-down park which still meets a variety of needs such as a place for small events, a playground, for allotments, or just for relaxation and meeting friends (Blake, 2013).

A priority in the design of pocket parks is the involvement of the local community. The park should be designed in consideration of their needs, and local inhabitants can play a role in the realisation and maintenance of the pocket park (Blake, 2013). In addition, pocket parks should be visible from the streets and attractive to invite more citizens to use them. Important is to meet the needs of a range of users without causing conflict between the needs. The design therefore asks for a careful balance between functions as the space is limited.

The pocket parks not only have a social and cultural value, but they can help regulate microclimates and act against urban heat island. Moreover, these parks also provide opportunities for increasing the amount of permeable surfaces and water retention. The small size makes the ecological value of the park limited, but they can still provide ecological benefits as they can function as patches and stepping stones for birds, small animals, and insects.

Ecosystem services:

Fig. 4.1.3. Infobox square, Gdynia.
Source: facebook.com/GdyniaInfobox

4.1.4. URBAN GARDENS

A large part of an urban area consists of urban gardens. With urban gardens, we mean private gardens as well as private, semi-public or public gardens, such as courtyards. The number of benefits that urban gardens may give to the city is astonishing. Planting that venues within urban area helps to integrate local communities, promotes a healthy eco-friendly lifestyle, recreation, and shows how important is the nature in our everyday life (Loran, Tratalos 2007). Apart from social and cultural functions, urban gardens play a significant role in fighting with urban heat island effect as they produce oxygen and help to regulate air humidity. Moreover, these urban gardens form a habitat for different animals that live within or on the borders of the cities (Gil, Handley 2007).

Urban gardens therefore provide possibilities if these gardens become greener and more sustainable. Inhabitants should be encouraged to keep their private gardens green or made them greener. Or groups of inhabitants can keep their courtyard green. Disused areas can be turned into urban gardens, and so can rooftops. To keep or made these gardens green, different plants can be planted, fruit trees and shrubs can be planted, vegetables can be cultivated, and when there is little room climbers and pots can be used. Other measures can be to collect rainwater, or to provide insect hotels, and nesting opportunities for different animals.

Ecosystem services:

Fig. 4.1.4. Rooftop garden and apiary on InterContinental New York Barclay Hote
Source: environment.nationalgeographic.com

4.1.5. MAKE GREEN PARKING LOTS

In 2014, there were 543 registered cars per 1000 citizens in Gdańsk (GUS, 2015). Due to this, and an increasing number of cars, more parking spaces are needed. The highest demand is in the city centre (Biuro Rozwoju Gdańska, 2012) for which large monotonous asphalted areas have been created. Such kind of areas have a highly negative impact on the attractiveness of the urban landscape, but more so on the city microclimate. Asphalt absorbs heat and thus increases the urban heat island effect (http://www.urbanheatislands.com/). In addition, these surfaces are impermeable requiring, special drainage and discharging into this urban sewage system. To reduce the harmful effects of asphalted parking lots, more pro-ecological solutions are needed in which surfaces are more permeable, for example turf grid. Turf grids can be also used on access routes and driveways. This kind of surface can carry loads up to 350 tons per m2 at the same time allowing grass to grow (geoSystem, n.d.). Additionally, this kind of coating is permeable, so it does not require special drainage and have positive impact on retention in the city (geoSystem n.d).

Parking lots can also be made greener by using trees and hedges to separate the different parking lanes. In particular, trees can contribute to reduce the negative effects of asphalted parking lots by providing shade and in such way reducing the heat absorption, and by remove pollutants from exhaust fumes out of the air. When there is limited space, also pergola´s with climbers can be used or smaller trees in pots. Not only can these solutions help to make a more environmental-friendly parking lot, it also makes a more attractive urban landscape.

Ecosystem services:

Fig. 4.1.5. Vegetation planting in the parking lot, Warszawa
Source: Anna Janus

4.1.6. GREEN ROOFS

A green roof is a surface covered by plants, which is located on an artificial surface in other words separated from the ground (Małuszyńska, Caballero-Frączkowski and Małuszyński, 2014). This could be surfaces located under, on and above the ground. This includes the roofs of underground parkings, buildings, and other artificial surfaces which can be converted into a green roof. We can even plant grass on roofs with a slope of 1:1. Green roofs allow enlarging the existing green space in a city (Łakomy and Bobek, 2011). Additionally, green roofs have plenty of benefits for the environment; they help to reduce urban heat island, improve the quality of air, increase biodiversity, and improve aesthetic quality of the building. Moreover, this environment-friendly solution can help with water retention.

Green roofs retain 70-90% of the precipitation that falls on them; in winter they retain between 25-40%. For example, a grass roof with a 4-20 cm layer of growing medium can hold 10-15 cm of water (Green Roofs for Healthy Cities, 2014). Green roofs can also reduce the amount of energy needed to moderate the temperature of a building, as roofs are responsible for the greatest loss of heat in the building, during wintertime and overheating during summer. For example, research published by the National Research Council of Canada found that an extensive green roof reduced the daily energy demand for air conditioning in the summer by over 75% (Liu and Baskaran, 2003). Moreover, green roofs extend the life of waterproof membrane, and help to protect it from weather conditions and solar radiation, and therefore it needs to be replaced less often (Łakomy and Bobek, 2011).

Ecosystem services:

Fig. 4.1.6. The roof garden of the University of Warsaw
Source: Anna Janus

4.1.7. VERTICAL GREEN

It is possible to apply plants on almost every artificial vertical surface; building walls, acoustic screens along highways, and fences; outdoor and indoor. There are several technologies to apply vertical green; you can chose for carriers with plants, covers with a hydrophilic substance, but the easiest solution is to use climbing plants. Indoors, green walls keep the temperature more constant through heat insulation; they lower the heat transfer coefficient. (Sharp, 2008 in Łakomy and Bobek, 2011) Outdoor and indoors, vertical green can contribute to noise reduction and cleaner air quality by removing pollutants and dust, and giving oxygen. Dependent on the species, climbers protect walls from damage and moisture, and the roots charge water from the wall surface and the air. (Bauman, 1991 in Łakomy and Bobek, 2011) In addition, vertical green can create a habitat for insects and birds, and can create a corridor from ground level to roof garden. (Blanc, 2008 in Łakomy and Bobek, 2011)

Ecosystem services:

Fig. 4.1.7. Green fence with geranium sp., Gdynia
Source Anna Janus

4.1.8. FEDGES

The word fedges means the combination of fence with hedge (Moll and Ebenreck, 1989). Instead of concrete or rusty fencing we should use fedges. Fedges can be formed with various shrubs and trees. In cities, fedges help to determine public, social and private space. Fences are used to give: privacy, sense of seclusion, wind breaks, obscuring unpleasant views (Thinking about fencing, 2005). However, a large number of fences are not particularly aesthetically pleasing, like one is behind bars. In particular, with a phenomenon as gated communities, fences are overused. In contrast, fedges have a high aesthetic value, and can play an important role for senses in smell, colour, different textures, and touch (Thinking about fencing, 2005). Each person can create their own, unique fedge which emphasizes the preferences and taste of creator by choosing different sizes, shapes, colours, and species which change with the seasons and topiary. Fedges can also produce food and materials like berries, wood and willow (Ussery, 2010). In such way, they can be more economically than a traditional wooden fence, and often require only minimal maintenance (Moll and Ebenreck, 1989). Moreover, fedges can provide habitat for birds, animals and insects. Fruiting hedges provide food for animals and people with species like plum, raspberry, and cherry. Other species which can be used for a fedge are carpinus, buxus, roses and others.

Ecosystem services:

Fig. 4.1.8. Miasto Ogród, Warszawa
Source: Anna Janus

4.1.9. USE NATIVE PLANT MATERIAL

According to an estimation of Paton et al. (2008) there are around 352 thousand plant species in the world, but every year this number decreases. According to WWF (20xx), up to 15 to 25 animal and plant species become extinct every day. It is however, highly important to prevent extinction and preserve biodiversity as it one of the cornerstones for the provision of ecosystem services (Audubon, n.d.). One of the major threats to biodiversity are invasive species (Pejchar and Mooney, 2009). Invasive species are non-native species which become established outside their natural range and can negatively impact environment and even health (Keller et al., 2011). Invasive plant species compete with native species partly as they do not have natural enemies in the new range. Their competition with native plant can in turn have an effect on animal species which are dependent on native species for example certain species of butterflies with their host plants. In 2012 there was 92 invasive species listed in Poland (Tokarska-Guzik, 2012). Japanese knotweed and Impatiens parviflora are some of the invasive species examples occurred in Pomerania District.

For this reason, we propose to use native plant material as much as possible, and to use non-native species only when we know these species do not cause harm to our environment. Furthermore, native plants are often better adapted to the local climate and soil conditions, so they need less care and arrangements (Audubon, n.d.). In addition, using native species gives place uniqueness and an opportunity to teach about local plants. Tilia cordata, grey alder and white poplar are examples of native trees for the Pomerania district (Wojewódzki Fundusz Ochrony Środowiska i Gospodarki Wodnej in Gdańsku, 2013). More knowledge about plants, which naturally occurring in Poland and Pomerania district can be easily found in document prepared by Regional Fund for Environmental Protection and Water Management (Wojewódzki Fundusz Ochrony Środowiska i Gospodarki Wodnej in Gdańsku, 2013) in Gdansk about native spices for Pomerania.

Ecosystem services:

Fig. 4.1.9. Tilia cordata planted in avenue
Source: Anna Janus

4.1.10. INVITE BEES TO HOTELS

In the latitude of Poland almost 78% of the plants are pollinated by insects (Pruszyński and Skubida, 2012). Moreover, 75% of food crops, like fruit trees and many vegetables, are dependent on insect pollination, mostly by honey bees (Bommarco, Kleijn and Potts, 2012). Unfortunately, bee populations are declining rapidly due to spread of pests; incorrect use of herbicides and pesticides; fewer beekeepers; and habitat fragmentation, degradation and loss (Klein et al., 2007). A measure that can be taken is to invite bees into the city. Bee hotels invite different pollinators to the city. These hotels can be beehives, but also simpler solutions like logs with holes; bundles of reed, straw or branches; or half-open stones. Such hotels can be small as a bird nest or can be a full structure which also gives a place for relaxation.

Beehives can be placed in the proximity of for them attractive areas like parks, courtyards, urban gardens, and allotment gardens. Yet, beehives do not necessarily need to be placed within these areas. On the top of buildings is an excellent spot for them. In Munich, the State Opera House offers bees a place on top of the roof and sells the honey as the Bavarian State Opera Honey (Lachermeier, 2013). Communities can thus benefit of beekeeping by selling the products, yet it can also be a good promotion. Actions to adopt bees are fortunately coming up, for instance, organised by Greenpeace Poland (www.adoptujpszczole.pl) or www.adoptabeehive.co.uk in the UK. These initiatives allow volunteers to contribute by paying small amount of money to fund setting up a hive.

Ecosystem services:

Fig. 4.1.10. Bee hotel, Sue Ryder Square in Gdynia
Source: Małgorzata Werdon

4.1.11. WILDFLOWERS MEADOWS

As habitat fragmentation, degradation and loss is one of the reason of the decline in pollinators, more areas for pollinators can be planned. Grass lawns can be managed in an eco-friendlier way by reducing the mowing regime to once a year in autumn. In addition, flower borders can be created with local plants that provide nectar and pollen during whole collection season, in other words make sure that there are plants which flower at different time periods. These colourful spots become 'restaurants' for pollinators and shelter for small animals, yet these are also enjoyable for people. By connecting different wildflower meadows by green corridors, a network can be created which can help pollinators migrate through the whole city.

Important is to plant bee-friendly species of plants flowering at different times, from spring to autumn. Those could be trees like hazel, willow, maple, lime and fruit trees like apple, prune, cherry, and plum. Important shrubs are dogwood, hawthorn, black cherry, wild rose, raspberry, currant, and goose berry. There are also some typical honey plants like buckwheat, phacelia and blueweed for instance. Also ornamental flowers such as catnip, thyme, heather, sunflower, nasturtium, marigold, dahlia, poppy, cornflower, crocus, and aster come as very attractive to bees. They also like herbs for example mint, rosemary, thyme and lavender (Fundacja Sendzimira, n.d.c).

Ecosystem services:

Fig. 4.1.11. Wildflower meadow, Kościuszki Square in Gdynia
Source: Małgorzata Werdon

4.1.12. BIRD AND BAT ACCOMMODATION

Several animals have adapted their life to urban areas, in particular songbirds and smaller mammals. Songbirds are much appreciated by urban residents and bird feeding and even annual bird counting becomes more established. According to research by the University of Washington, people are more likely to live in areas where birds are which can directly bring economic vitality to city (Ma,2015). These birds often pleasure us with their songs, yet in the meantime they also help to control insect population like those of mosquitoes. The same accounts for bats which, luckily, become more appreciated.

Designers can help to improve the urban habitat by providing more nest opportunities, and connected green spaces. Nest opportunities can be improved by planting more trees, shrubs, and hedges but also by using climbers for green walls. Another possibility is to integrate nest opportunities within buildings, ornaments or as independent objects. A good example is the large pergola in the Maxima Park, Utrecht, designed by West 8. This pergola is an object of art, but also provides room for climbers and it has integrated nests for birds and bats.

Ecosystem services:

Fig. 4.1.12. The Nest Project
Source: Fieldwork Facility

4.1.13. FLOATING ISLANDS

The many waterways in Gdansk provide another opportunity to invite more birds to city area; by floating birds nesting island. These artificial nests can be without vegetation or planted with semi-natural vegetation dependent on the species you want to accommodate (Burgess and Hirons, 1992). The installations provide a safe and comfortable habitat for nesting away from shoreline predators and adaptable to floods. They are in particular interesting in places where no eco-friendly shore is possible (joostdevree.n.d.). Moreover, floating islands have been an acknowledged natural solution for cleaning the water by removing nutrients and pollutants such as phosphorus, ammonia, and total suspended solids (Didderen and Paalvast, 2015). This, in turn, helps to improve the water quality and create a healthier habitat for other wildlife like fish and aquatic invertebrates. In addition, floating islands can make waterway visually more attractive by adding more green and offer an ideal educational opportunity and community focal point.

Important is that the floating islands are built to resist wave breaks, and are attached so that they do not float away but also not sink when water level rises. They also need to provide an opportunity for plants to grow and should be able to carry the mass of plants and animals. The floating nests can be made out of willow or wired coconut fibres with substrate for plants. For the visually attractiveness of vegetated floating island, it is essential to maintain the islands and to plant them with appropriate plants (joostdevree.n.d.).

Ecosystem services:

Fig. 4.1.13. Floating islands used as a measure to improve water quality
Source: http://www.floatingislandinternational.com

4.1.14. ADD SOME GREENERY TO STREETS

Streets should be tree-lined open spaces with a high environmental quality where possible; they should be green streets. Green streets should pay attention on creating excellent and convenient facilities for pedestrian and cyclist. These green streets should connect different green spaces in the city. Also public services and civic buildings should be surrounded by green. Green streets mean also permeable surfaces - pavements and bicycle paths made from gravel. Green streets can have tram tracks and be covered by grass or extensive plants –sedum (Schreiter, 2010). There are different options of making greenery on pavements and streets. Parklet is a parking space changed to recreational spot. It provides amenities for people using the street. According to Final Report to EPA (Dill et al., 2010), residents which live along a green street, walk more than the others. They are more likely to say hello, and stop to talk with neighbours. Green streets can then also make streets more liveable.

Ecosystem services:

Fig. 4.1.14. Morus alba trees in neighbourhood
Source: Anna Janus

4.2. PRESERVING COAST AND WATER

4.2.1. PROTECT WATER AQUIFERS

In Gdańsk, 70 % of the drinkable water comes from water aquifers (http://www.sng.com.pl/). These aquifers also prevent the seepage of salt water to the lower agricultural areas along the coast. These water supplies, therefore, need protection and care. A first step is to make sure no more water is extracted than can be replenished. Then to make sure that water can infiltrate into the ground so that it can supply the aquifer. Much of the water in aquifers originally comes from precipitation which through a permeable layer infiltrates, becomes filtered and streams into the aquifer (http://culturesofenergy.com/). Rainwater should, therefore, have the possibility to infiltrate instead of running off into streams and the sewages. More permeable surfaces and water retention measures like basins and bioswales are needed. Furthermore, pollution of aquifers should be limited. Drilling around water aquifers should be prohibited and polluted water sources should be sealed off from aquifers (AE, 2013). The use of chemical substance should be reduced, including the use of pesticides in agriculture. These substances come directly to the ground, and into the groundwater.

Ecosystem services:

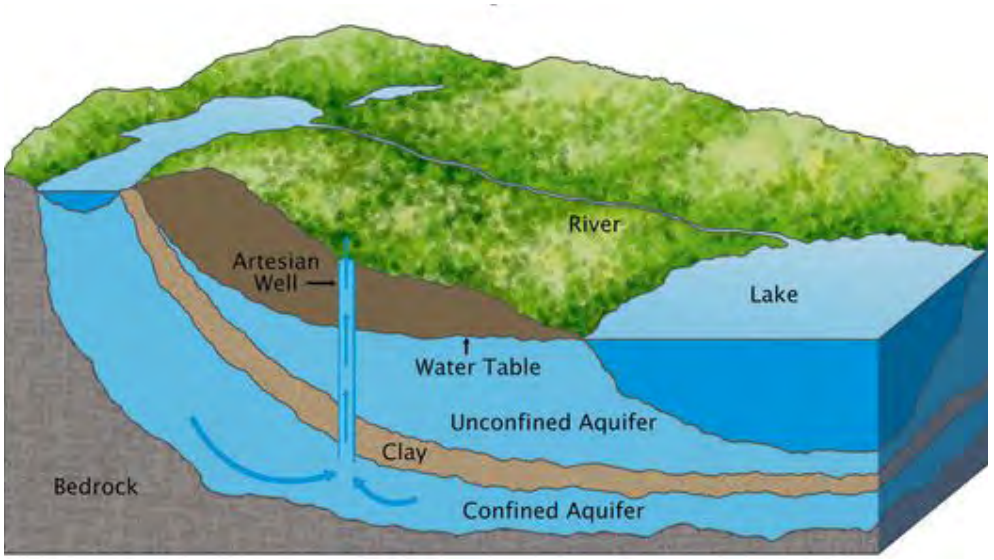

Fig. 4.2.1. Water aquifer section
Source: http://education.nationalgeographic.org/

4.2.2. PROTECT NATURAL DUNE EMBANKMENT

Dunes act as a kind of flexible natural protection against erosion and flooding. At an eroding coast, dunes are moving inward which causes loss of land. According to Łabuz (2013), there are several methods and actions to protect seashores which little interfere in the environment. Treatments to stabilize the dunes should only be applied in touristic places. Instead of strengthening steep dune slopes with grasses and fences, plant native species in variable composition. Moreover, reduce fragmentation of dune habitats by descents and concrete tiles, but reconstruct only natural dune shafts. It is, however, possible to use light materials to reconstruct dunes; materials like geotextiles or gabions. Secure a place in the back of the dunes for its natural reversing. It refer to places with considerable erosion. Do not forestry shaft dunes.

Ecosystem services:

Fig. 4.2.2. Natural dune in Wyspa Sobieszewska
Source: Agata Malengiewicz

4.2.3. THE RETENTION ABILITIES OF FORESTS

Among many other qualities, forests are important for their role in water retention and erosion prevention. Forests ´can help to prevent and mitigate water-related risks as floods, droughts and landslides´ (Forest Europe, 2015). For floods this may only account on the smaller scale (Calder, 2007). Trees have an umbrella-effect (Fazio, 2010). Effects of rainfall can be buffered by the process of interception when large amounts of water are retained by leaves and bark. This process allows water to evaporate and to slowly reach the ground (Fundacja Sendzimira, n.d.; Fazio, 2010). Coniferous trees are even better in intercepting rainwater than deciduous trees. In addition, the absorbing and anchoring abilities of roots help to stabilize the soil, clean water and recharge groundwater (Fazio, 2010). This ability also helps with droughts as trees can help to capture soil moisture and retrieve water (European Environment Agency, 2015). Fallen leaves create a spongy layer that helps to retain moisture and allow rainwater ´to percolate into the soil instead of rushing off´ (Fazio, 2010, p3). This spongy layer, and the anchoring abilities of roots which ´hold the soil in place´ (Fazio, 2010, p3), help with the prevention of runoff and in this way also with the prevention of water erosion. In particular, in places with steep slopes such as dune embankments forestation can be beneficial to counteract erosion. Yet, also within urban area, and agricultural areas, trees can help to reduce runoff and retain water. Within planning it is therefore important to preserve forests, especially in places where erosion can be a problem, and to enhance these forests to improve the retention ability. Well managed forests with understorey and a leaf covered soil are better in water retention than monoculture plantations with bare soils. The latter can perform even worse than agricultural land and pastures (Calder, 2007). In addition, roads, drainage ditches and logging can have a negative effect on water erosion and should be considered in sustainable forest management.

Ecosystem services:

Fig. 4.2.3. Forest's great ability of water retention.
Source: https://hermitsdoor.wordpress.com

4.2.4. ALL PLUGGED TO THE SEWAGE

One of the best options to reduce water pollution is to make sure households are plugged into the sewage system. When used properly, this is an effective solution. Nowadays, municipalities often offer subsidy to connect houses to the sewage system. For homeowners this is a comfortable solution as it does not give problems with overflowing septic tanks or bad odours. Moreover, it increases the value of the property. Sewage systems are also environmentally a better solution than leaking and wrongly used tanks (Miejskie Przedsiębiorstwo Wodociągów i Kanalizacji w Lublinie Sp. Z o.o., 2013), which cannot only leak contaminated wastewater, but also various toxic compounds, phosphates and nitrates to the soil and groundwater (Urząd Miasta w Tuszczynie - Referat Dróg i Zieleni).

Not always is plugging to common sewage system possible. Then there are two main possibilities: a septic tank or a household sewage treatment plant. There is discussion which method would be better, but the truth is that both are ecologically sound if they are used properly and honestly. Every machines or device requires maintenance and repairs – sewage systems also! Septic tanks are used when the groundwater level is too high to filter wastewater into the ground ground (Szambo w przedsiębiorstwie). However, generally this technique should be temporary. The main mistakes are: transmission contents of septic tank into the ground; infrequently emptying of tank; discharge liquid into gardens, ditches and fields. With household sewage treatment plant, the filter and other equipment need to be changed. Furthermore, is it important to take care of the purifying bacteria; refill them and not to use too much detergent as bacteria do not like chemical compounds (Dąbrowska, 2013).

Ecosystem services:

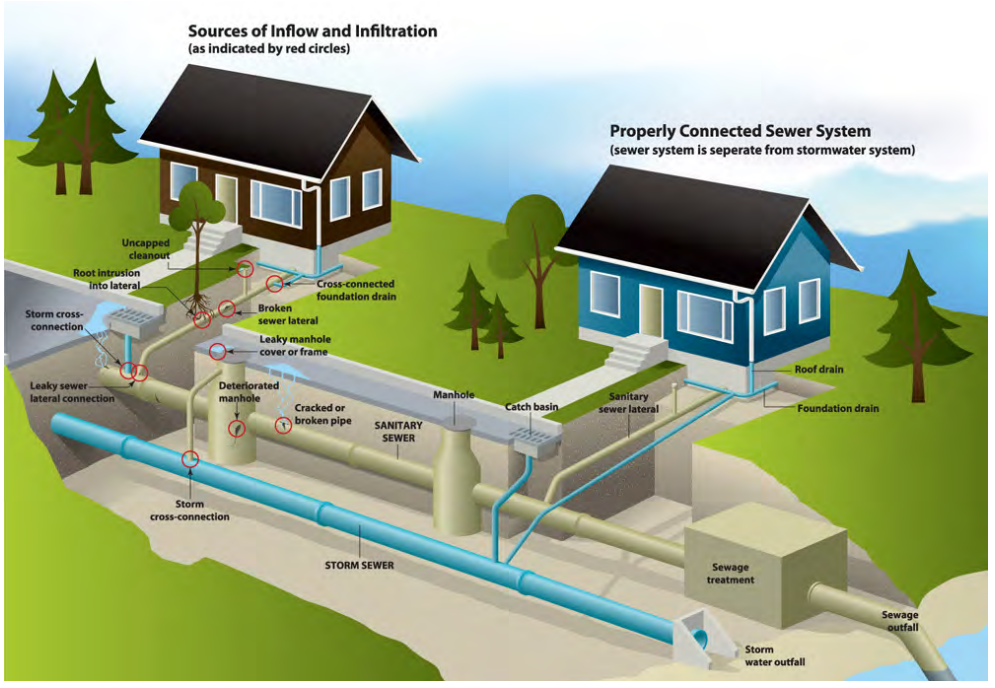

Fig. 4.2.4. Sewer system diagram
Source: http://www.york.ca/wps/wcm/connect/york-public

4.2.5. ROOM FOR RIVERS AND FLOODS

To cope with the effects of climate change, the flood capacity of rivers need to be increased. "Dike enforcements alone will not be enough" (Ruimte voor de rivier, 2012, p5) and other flood protection measures are needed. The Dutch ´room for the river´ program defines several measures for along main rivers and estuaries, rivers like the Vistula.

Some of these measures help to improve the capacity of the riverbed, for instance by excavating the surface layer of the river bed so that river because deeper and flood capacity increases (Ruimte voor de rivier, 2012). Another measure is to remove or modify obstacles from the river bed such as bridge basements so that the flow of the river because less disturbed. Obstacles that also can be modified are the groynes in the river. These groynes help to maintain the location and depth of the river. With high water, these forms can, however, obstruct the river water flow which can be solved by lowering the groynes (Ruimte voor de rivier, 2012).

Other measures focus more on restoring the natural floodplains of the river, such as:

- Lowering the floodplains along the river through excavation to create more storage capacity;
- Relocating dikes more land inwards to create more floodplain;
- Creating of high-water channels to discharge surplus water via a separate route;
- Depoldering of reclaimed land. With this measure, the dike is moved inwards, removing the barrier between river and polder which allows the flooding of the polder during high water levels (Ruimte voor de rivier, 2012).

These measures require more space and often change the land use; turning agricultural land into pastures, extensive natural grazing areas, or nature areas with wetland. Due to the land use change, the required lands often need to be obtained or land owners need to be compensated.
All the above mentioned measures can be individually developed, yet often these measures are also combined. Combining them has the benefit of increasing the flow and storage capacity on a smaller area.

Ecosystem services:

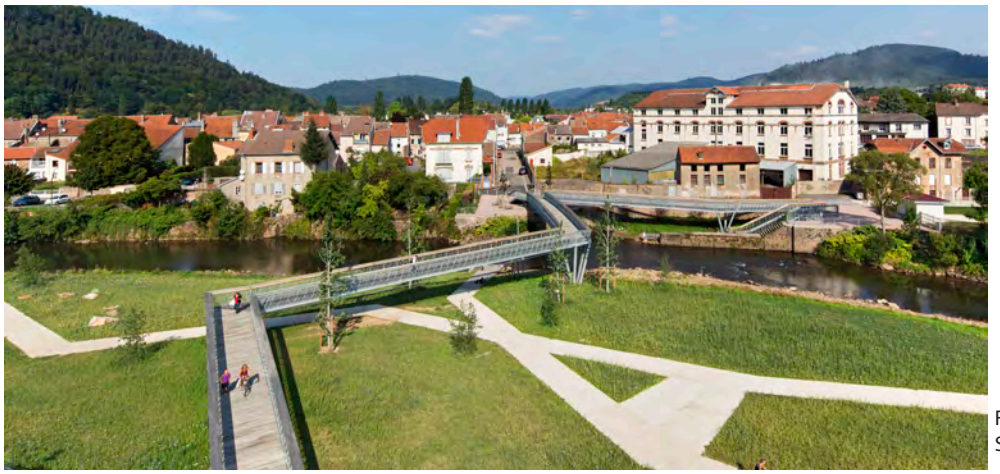

Fig. 4.2.5. The Meurthe edges
Source: http://www.archdaily.cn/

4.2.6. MULTIFUNCTIONAL FLOOD DEFENCES

When there is little room for space-occupying flood protection interventions, one needs to look on how to strengthen the current flood defenses (Ruimte voor de rivier, 2012). Yet, within high urbanized areas even this can be a challenge as pressure on land is high. For this reason designers should look for solutions that are universal and serve many purposes. An answer to that request is the multifunctional flood protection infrastructures. In addition to flood protection, they fulfil societal functions and are a functional part of their urban or rural environment (Multifunctional flood defences, n.d.). Those functions include for example urban functions, landscape and ecological measures, infrastructure and recreation.

Innovative concepts and approaches are needed to develop solutions which integrate different functions, hold extra benefits while reducing the costs of implementation, and most importantly significantly strengthening the dike structure against flooding (Oderker, 2013). To reduce costs of multifunctional flood defenses which are higher than in normal solutions, it is useful to add economic purposes to the investment and involve many stakeholders. As in every process of designing flood defense infrastructure it is vital to execute a comprehensive analysis, and research several alternative solutions, and in the end choose the best option. Multifunctional flood defenses are always solid interventions, but they can be divided into hard, semi/hard and soft concepts (Oderker, 2013).

Ecosystem services:

Fig. 4.2.6. Coffer dam, Rheinalleetunnel in Duesseldorf
Source: http://www.wikiwand.com/de/

4.2.7. RENATURING RIVERS AND STREAMS

Another possibility to manage flood risks is restoring and renaturing of rivers and streams. The aim of these measures is to protect, restore and emulate "the natural regulating functions" of rivers and catchments (EA, 2010 in RESTORE, 2013, p18). River restoration and renaturalization projects give numerous possibilities in water management both in the smallest scale and in great flood protection projects, and can include the following measures:

- Returning culverted rivers and streams back to the surface;
- Restoring the natural course of the river or stream for instance by making it meandering again;
- Allowing variation in depth with sand or gravel banks;
- Giving the river more room by extending the flood plains;
- Removing structures like dams or adding fish ladders when dams are needed;
- Removing hard banks, and replace them with shallow natural shores with vegetation and other natural features.

These measures help to increase the flood storage capacity, reducing the volume and speed of water which reduces water erosion and polluting runoff. Next to increased flood security and erosion control, the measures also have considerable environmental and natural benefits (Strayer and Findlay, 2010). Moreover, it creates new green spaces and opportunities for recreation (RESTORE, 2013); making the river part of daily life, and helping inhabitants to bond with water and increase their respect for nature. Some great examples of renaturing rivers are the Isar river in Munich and the Emscher in the Ruhr area in Germany.

Ecosystem services:

Fig. 4.2.7. Renaturation and disclosure of the Kappelbach, Chemnitz
Source: http://www.rehwaldt.de/

4.2.8. ECO-FRIENDLY BANKS

Another effective measure to improve the ecological function of waterbodies, are ecological-friendly water banks, or simply eco-friendly banks. This measure is not only suitable along rivers and streams, but also at the banks of lakes, ponds, basins, and even ditches. According to Sollie et al. (2011), the core idea of eco-friendly banks is that, in comparison to technical hard banks, more room is given for banks to provide more habitat for plants and animals. Yet, the measure also contributes to erosion control through soil fixation by plants; improvement of water quality through the uptake of nutrients; and more attractive landscapes by adding more variation and colour (Sollie et al., 2011). To create a healthy vegetation or a varied vegetation from land to water, or along the length of the bank, good knowledge of vegetation development in relation to factors like soil, water quality and hydrology is essential (Sollie et al., 2011). Eco-friendly banks can be divided in three vegetation zones: aquatic zone with hydrophytes which are submerged in water or on the water surface such as water lilies; amphibian zone with halophytes which are rooted under water such as reed and yellow flag (Iris); and the terrestrial zone with plants that can grow in wet conditions.

In situations with low flow velocities and little erosion, eco-friendly banks can be made without additional structures. Ideally, an eco-friendly bank has a very gradual slope. Halophytes for instance do not grow on banks steeper than 1:2; the steeper the bank, the less space for vegetation and variation in it (Sollie, et al., 2011). Yet, in cases with less space, terraced slopes offer the possibility to still develop a more varied vegetation.

Disturbances from recreation, livestock, or waves by ships or winds also influence the vegetation and can erode the bank. Additional measures might then be necessary. Hard structures like staircases or piers can be placed in places with disturbance by recreation. For banks which have to deal with high stream velocities, waves, and erosion, different measures can be implemented which often combine hard and soft solutions. For example:

- Live staking involves planting of a woody cutting of, for instance, red-osier dogwood and willow into the ground so it develops an intricate root system that will stabilize the soil. This method is used on the eroded banks where are high stream velocities, extensive toes and stream level erosion (Environment Agency, 20xx).
- The live fascines method is often used in combination with live staking. Live fascine is a long bundle of woody vegetation buried within a shallow trench parallel to the flow of the river. This prevents surface erosion by developing a root system, and it works well during occasional heavy flows and with high flow velocities (Environment Agency, 20xx).
- Brush mattresses are layers of interwoven live branches that can planted into slopes. Joined to these mattresses by wire are live rascines which are placed along the eroding bank. This method slows the water velocity and gathers sediment. The vegetation, which grows over those mattresses, improves the water quality as the plants filter out pollutants. This solution is successfully in use in steep bank enduring high flow velocities (Environment Agency, 20xx).

Ecosystem services:

4.2.9. CONSTRUCTED WETLANDS

Constructed wetlands are man-made shallow ponds or canals which are planted with water and swamp plants. The aim of a constructed wetland is to improve the water quality through the wetland vegetation, soil and their associated microbial assemblages (National Risk Management Research Laboratory, 1999). Constructed wetlands are eco-friendly solution, which help to remove nitrogen (up to 90%), have metals (up to 80%) and phosphorus (up to 100%). This solution can also minimize the number of bacteria in the water (Jurries, 2003). It also provides habitat for wildlife (National Risk Management Research Laboratory, 1999). This solution is usually less expensive than traditional wastewater treatment options. Moreover, it has low maintenance costs (U.S. Environmental Protection Agency, 2004). However, the efficiency is delay 1 to 2 seasons until vegetation will be well established. Constructed wetlands can be used to treat various kinds of wastewater such as urban run-off, municipal, industrial, agricultural and acid mine drainage (National Risk Management Research Laboratory, 1999). Yet, they need to be design on uplands, and outside floodplains and floodways, in order to avoid damage to natural aquatic resources (U.S. Environmental Protection Agency, 2004). The constructed wetland should be created as a long and relatively narrow depression. Jurries (2003) recommends to use a length to width ratio of 5:1, but minimum ratio is 2:1 as the long length extends the filtration time. Wetland plants should be chosen according to be treated wastewater and preferably three to eight different plants should be used (Jurries, 2003), yet the wetland can also be allowed to grow naturally (U.S. Environmental Protection Agency, 2004).

Ecosystem services:

Fig. 4.2.9. Constructed wetlands at Providence Estate, Greenvale, Victoria, Australia.
Source: Programmed Property Services

4.2.10. (BIO-)RETENTION BASINS

Low impact development (LID) are design solutions, that use natural and engineered water infiltration solutions and storage techniques to control water runoff where it is generated (Guillette, 2010). Bio-retention basins are one of these LID solutions which consists of a shallow depression planted with aquatic plants, and designed to retain and infiltrate rainwater runoff (Clark and Acomb, 2008). Bio-retention basins are usually created in community and non-residential areas. The size depends on volume of runoff, but usually is something between 100 to 800 m2 (Water by design, 2014). A smaller version does not need special engineered calculation for water storage, and are more considered as rain gardens which can be perfectly implemented in backyard gardens (Clark and Acomb, 2008). The main objective of a bio-retention basin is to retain, filtrate and treat rainwater runoff using specialized soil mixtures, aggregate bases, underdrainage and vegetation tolerant for short term flooding (Guillette, 2010). This measures help to remove petroleum products, nutrients, metals, and sediments, as well as bringing purified water to groundwater supplies (Guillette, 2010). Bio-retention basins also help to increase biodiversity and improve habitat for wildlife. Moreover, it is aesthetically pleasing, if properly designed and therefore gives additional aesthetic value to urban areas (Clark and Acomb, 2008).

Bio-retention basins should be placed in area where infiltration is good; not in place where water normally pounds (Clark and Acomb, 2008). The length-width ratio should be around 2:1(Endreny and Collins, 2009). In addition, it should be located at least 3 meter from buildings to avoid moisture around the building foundation (Clark and Acomb, 2008). Grass buffer strips can be used to reduce runoff velocity (Lake Superior Streams Duluth. n.d.), and it is highly recommendable to use native plant material to reduce maintenance and improve biodiversity (Clark and Acomb, 2008).

Ecosystem services:

Fig. 4.2.10. Bioretention basin in Plainfiled
Source: http://www.jdcivilengineers.com/

4.2.11. RAIN GARDENS

Rain garden are small facilities which can be easily implemented in backyard gardens and do not need to be engineered (WSU Extension, 2016). Rain gardens are vegetated depressions that use rainfall and rainwater runoff for irrigation. This solution helps removing pollutants by filtering rainwater runoff through natural vegetation and soil-based systems, and in addition helps to recharge groundwater resources and improve the water quality. There are two basic types of rain gardens: under-drained, and self-contained (Low Impact Development Center. 2007). The choice depends on the volume of water that needs to be treated, soil conditions, available space, and project budget. Self-contained rain gardens typically hold moisture longer than under-drained ones. Rain gardens should be located at least 6 meters from building to avoid damage to the foundations. Moreover, rain garden should be placed in sunlight (Bannerman, 2003). Recommended is to use hydroficated plants, and to use perennials instead of annuals (Fundacja Sędzimira, n.d. a). Furthermore, is advised to use native spices, such as hairy sedge, iris, or royal fern, because these species are more used to Polish weather conditions (Fundacja Sędzimira, n.d. a).

Ecosystem services:

Fig. 4.2.11. Private Rain Garden
Source: : Fundacja Sendzimira

4.2.12. BIOSWALES

A bioswale is a linear depression designed for conveying rainwater. This solution is usually used in streets and parking lots (Clark and Acomb, 2008). Bioswales achieve the same goals as rain gardens; slowing and filtering rainwater. This system is, however, calculated to manage specific amounts of runoff from surrounding areas. A guideline is that the total area of the bioswale should be 1% of area of which it receives rainwater, and the bioswale should be able to convey rainwater of "at least a 10-year storm" (Natural Resources Conservation Services, 2005). Bioswales cannot, however, be used in very steep or flat areas as they need a slope from 1 to 6 % (Jurries, 2003). There are two commonly used bioswales: dry and wet. A wet swale can be compared to wetlands cellar (Capital Regional District, n.d.) and uses water tolerant vegetation to reduce water runoff and slowing and storing rainwater. In addition, this solution provides water quality treatment. Dry swale function as a soil filter system, and provide quantity and quality control using storm water infiltration (Clark and Acomb, 2008). Recommended is to plant deep-rooted native species to increase infiltration and reduce maintenance (Natural Resources Conservation Services, 2005). Bioswales provide several benefits such as water treatment by using soil, vegetation, and microbes. It can reduce runoff by 88.8% and total pollutant loading by 95.4% (Xiao and McPherson, 2011), increase water infiltration, and help with recharging groundwater (Clark and Acomb, 2008). Moreover, bioswales are usually less costly to create and maintain, than curb and gutter or underground storm sewer systems (Caflisch and Giacalone, 2015) and are also a more aesthetically pleasing solution which can improve the landscape value (Clark and Acomb, 2008).

Ecosystem services:

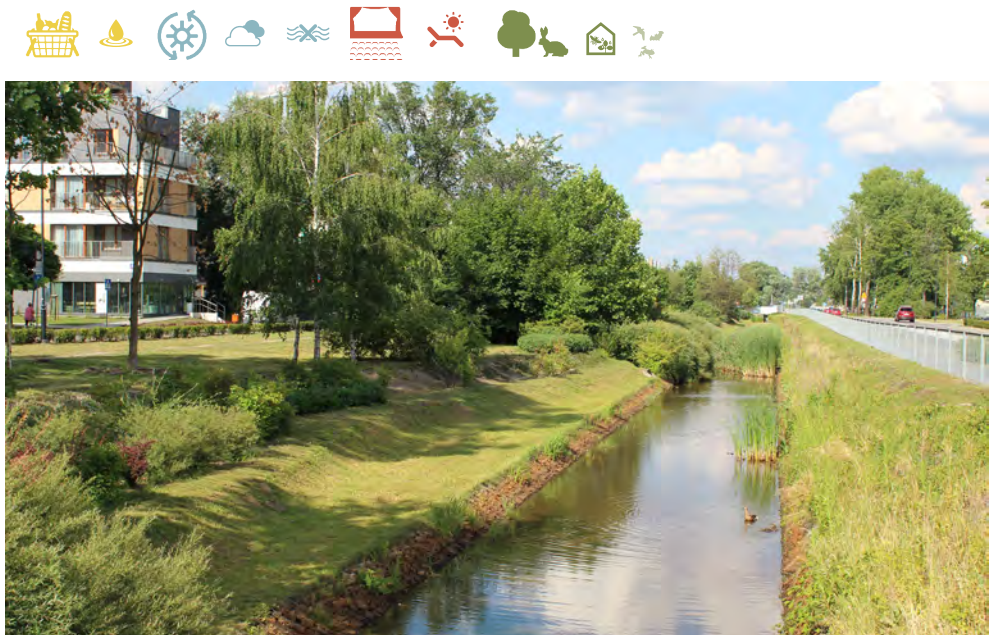

Fig. 4.2.12. Bioswale in neighbourhood, Warsaw
Source: Anna Janus

4.2.13. RAIN WATER COLLECTION

People harvest rain water harvesting since early Holocene, and it was a way to adapt to local climates and climate changes (Pandey, Gupta and Anderson, 2003). Unfortunately, the custom to collect rain water became less popular over the years. Each year there is about 541 mm of precipitation in Gdańsk (Climate-data.org, n.d.) which means about 541 l of water per each square meter. Collecting and using this water, even partly, can provide great savings for citizens, entrepreneurs, government and of course for nature (Che-Ani et al., 2009). The good thing is that rain water harvesting can be implemented on varies scale from household to large industry complexes.

Rainwater harvesting can be simple implemented in households by connecting simple tanks or ponds to downpipes. The collected water can be used for watering plants or for washing the car. A more complicated and costly solution is an underground tank. With this solution, rainwater can be used for flushing toilets, wash clothes, and other non-potable usages of water. This system, however, needs an additional sewage system in the house, though it can provide great savings in water bills (Kukreja, 20xxb).

Food production can also get profits from rainfall. Rain water is perfect for crop irrigation, because it does not contain salts or heavy metals (Helmreich and Horn, 2008). Moreover, farms with large roof areas allow to collect and storage large amounts of rainwater (Oasis Rain Water Harvesting. n.d). One can use in agriculture either an underground tank or tank above ground, though a underground is more recommended as it is less vulnerable to damage, and it keeps water fresh due to temperatures below 12˚C which prevents bacterial growth (Oasis Rain Water Harvesting. n.d).

Rainwater harvesting systems can also be profitable for industry. In Rochdale, three rain water harvesting systems were installed on a large distribution center. In one year, it enabled to store 23 million liters of water. The return on this investment only took one year (The Renewable Energy Hub. n.d.). Moreover, rainwater is better for industrial machinery because it contains fewer minerals than main water supplies (The Renewable Energy Hub. n.d.).

Ecosystem services:

Fig. 4.2.13. Rainwater harvesting for domestic use (left) and for industry (right)
Source: http://www.revolutionpower.co.uk/

4.2.14. PERMEABLE PAVEMENTS

Permeable pavements are a good alternative for conventional paving; not only for in residential areas, but also as parking lots, streets or even in industrial areas. The most important feature of permeable paving is that it permits the flow of water and air so that the underground can absorb water and "breathe". Permeable paving can reduce the transportation of increased stormwater runoff and pollutants into our natural waterways, allows infiltration of storm water, slows down the reticulation of water to water system, and also helps to recharge the groundwater (Shackel, Ball and Mearing, 2003). At first it may seem to be costlier than traditional solutions, but it must not be forgotten that permeable pavements are a self-draining systems which eliminates the cost of drainage.

The pavements can be segmental shaped paving or can have a homogeneous surface. The construction of a permeable pavement is as follows: 1. a top layer with the actual paving material, 2. the second layer containing a gravel bed, 3. the third layer is a filter fabric, 4. the bottom layer should be a bed of sand (Landscaping Network, n.d.). There are many possible materials to use. Dry-laid pavers allow water to pass through openings in pavers or stones and at the same time give opportunity for grass or moss to grow in the openings. Brick, as a porous paver, leaves gaps which direct water to joints and open spaces. Gravel or crushed stone enables rainwater to pass through. Also flagstones and slates can be used with gaps in between filled with gravel or planting. Ground reinforcement grids give a structure to the paving. Plastic mats with cells also serve the same purpose and offer interesting shapes, for instance circular or hexagonal cells. Grass pavers resemble normal lawns but are made of open cells filled with dirt and planted with grass (Landscaping Network, n.d.).

Ecosystem services:

Fig. 4.2.14. Permeable pathway, Platinum Business Park Warsaw
Source: Anna Janus

4.3. PRODUCING A SUSTAINABLE FARMLAND

4.3.1. AGRICULTURAL TOURISM

Agricultural tourism, or often called agritourism, is defined as agricultural holidays with activities offered on working farms and other agricultural settings for leisure or educational purposes. A study of the NC State University (Xu et al., 2015) indicates the most important benefits from agritourism. A significant benefit is the education of visitors about agriculture. Agrotourism offers city residents an opportunity to learn about where food comes from and about nature and in such a way gain more respect for it. Farmers can share agricultural heritage and rural lifestyles with visitors and in such a way give an incentive to farmers to preserve rural heritage and traditions because their clients are interested in them. Importantly, is that agritourism can generate additional income alongside farming itself which helps to preserve farms and farmland. Farmers can next to day activities, also offer holiday accommodation at the farm and sell local products in shops and venues. The latter can help in preserving local crops, products, and cuisine. Agritourism farmers and promoters, like local development agencies and tourist offices, could capture those benefits in their advertising materials to encourage new tourists to visit their farms (Xu et al., 2015).

Ecosystem services:

Fig. 4.3.1. Child getting to know the livestock.
Source: https://lapoussine35.wordpress.com

4.3.2. ORGANIC FARMING

"Organic farming is supposed to protect the environment, minimize soil degradation and erosion, decrease pollution, optimize biological productivity and promote a sound state of health" (Martin, 2009). In this concept maintaining long-term soil fertility and biological diversity within the system is crucial. Recycling of materials and resources must happen to the greatest extent possible within the farm. Farmers have to take special care and promote the health and meet the needs of livestock. Such farms succeed in many positive ways. Among those results of are organic products, emphasizing careful processing, and introducing innovative method. Thanks to them the organic integrity is maintained and vital qualities of the products are very high, as they rely on renewable resources in locally organized agricultural systems (Martin, 2009).

The most common techniques used in organic fabric are: crop rotation which is a technique to grow various kinds of crops in the same area, according to different seasons, in a sequential manner; green manure that refers to the dying plants that are uprooted and stuffed into the soil in order to make them act as a nutrient for the soil to increase its quality and also biological pest control which is a method that allows living organisms to control pests, without or with limited use of chemicals. Another very popular thing in organic farming is composting that grants fertilizing with recycled organic matter that is highly rich in nutrients (Agriculture, 2013).

Ecosystem services:

Fig. 4.3.2. Sustaining the Life of the Organic Farm
Source: https://lcaobafarms.blogspot.com

4.3.3 SUSTAINABLE CROP ROTATION TECHNIQUES

Sustainable agriculture techniques help to ensure high performance without compromising the natural systems and resources. Crop rotation is the practice to grow different crops in succession on the same field (Union of Concerned Scientists, n.d. c). Crop rotation is an effective solution to pest problems. Many pests have a preference for specific plants, and continuous growth of the same crop guarantees them a steady food supply. Crop rotation breaks these pest reproductive cycles (Union of Concerned Scientists, n.d. c). Furthermore, rotation, that includes legumes such as peas or beans, provides the following crop with significant amounts of nitrogen. According to Gardner and Drinkwater (2009), legumes have the ability to fix nitrogen. This fixed nitrogen remains in the soil longer than nitrogen from synthetic fertilizers, and in such way less nitrogen can leach into groundwater, or ends up in the run-off from fields and pollute streams (Gardner and Drinkwater, 2009). Cover crop, which means having a constant coverage of plants on the field, may also bring benefits for farmers. Planting cover crops such as hairy vetch, clover, or oats prevents soil erosion, enhances the soil quality, and suppresses weeds (Union of Concerned Scientists, n.d. d). This reduces the need for herbicides, insecticides, and fertilizers. Moreover, with crop rotation and cover crops, farmers can yield multiple times a year. Even though cover crops might have lower value, these plants can be used for different purposes such as food, oil, or biogas production.

Ecosystem services:

Fig. 4.3.3. Crop rotation
Source: Olga Nowakowska

4.3.4. USE RENEWABLE ENERGY TO SUPPLY FARM SETTING

Agriculture is large consumer of fossil fuels and a large contributor to greenhouse gas emissions. With its dependency on mineral resources and the increasing price of the resources, it becomes clearly worth to start applying alternative sources of energy ("Science for Environment Policy": European Commission. 2013). The use of fossil fuels in farming could be substituted by renewable energy sources such as wind, photovoltaics, hydroelectricity, and biomass. With help of solar heat collectors, farmers can dry crops and warm homes livestock buildings, and greenhouses. Solar water heaters can provide hot water for dairy operations, pen cleaning, and homes. Solar electric panels (photovoltaics) can power farm operations and remote water pumps, lights, and electric fences. Natural daylight could be captured and used in buildings and barns instead of electric lights (Fischer, J.R., Finnell, J.A., Lavoie, B.D., 2006). Solar power is often less expensive as costs on electricity and heating are reduced. Wind power is well suited to pump water and generate electricity. When there are strong winds, excess energy can be sold on the energy network and in such way bring additional income to farmers. Including infrastructure, a wind turbine needs only half an acre which leaves space for farmers to plant their crops just next to the turbine's base, and use the potential of their fields twice (Union of Concerned Scientists, n.d. b). These two measures can give more independence to the farmer, and at the same time reduce air pollution and greenhouse gas emissions.

Ecosystem services:

Fig. 4.3.4. Wind power mills in rural area of Żuławy
Source: Olga Nowakowska

4.3.5. BIOGAS PRODUCTION

Biogas is a gas consisting of methane carbon dioxide which is produced during the process of anaerobic fermentation or in other words decomposition without oxygen (Kukreja, 20xxc). Biogas is a way of producing of a renewable and green energy, though the technology is simple, it is still developing. Yet, it seems and effective form of energy production and cost reduction (Gerlach, Grieb and Zerger, 2013). The advantage of biogas is that it is mainly produced from biodegradable waste materials such manure, crops and biomass waste. This can reduce the amount of waste in landfills and dumps and reduce the use of mineral gas as well as make farms more sustainable by decreasing soil and water pollution from overuse of manure, and by reducing the emission of greenhouses gases from stock such as methane. Did you know, that a single cow can provide enough waste material within a day to power a light bulb the entire day (Kukreja, 20xxc). In addition, biogas production offers farmers to become self-sufficient or even producers by building a biogas plant. The biogas can be sold to energy companies that "produce fuel for cars and tractors and heat and power for homes and businesses. "According to the U.S. Department of Energy, tripling U.S. use of biomass energy could provide as much as $20 billion in new income for farmers and rural communities and reduce global warming emissions by the same amount as taking 70 million cars off the road" (Union of Concerned Scientists, n.d. a). Biogas installations are also easy to set up and require little capital investment on a small scale basis. In such way, farmers can turn waste into products.

Ecosystem services:

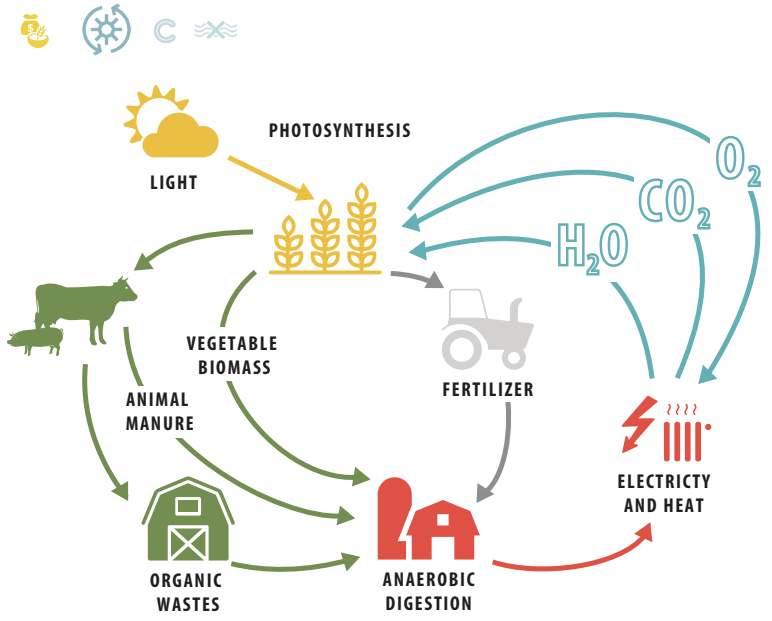

Fig. 4.3.5. Biogass proccess diagram
Source: Cristina Rodriguez Alvaro

4.3.6. CREATE MULTI-CULTURE FOREST

Through the ages, forests provided different ecosystem services such as hunting, wood production, and gathering of foods such as acorns, berries, and mushrooms. Only after the industrial revolution, forests were gradually turned into monocultures which were mostly consider as a source of timber. In the last decades, the perception on forest as source of timber shifted back to a more multi-functional view. This time with more focus on nature conservation and recreation (Convention on Biological Diversity. n.d.) and gathering of foods such as acorns, berries, and mushrooms. Only after the industrial revolution, forests were gradually turned into monocultures which were mostly considered as a source of timber. In the last decades, the perception on forest as source of timber shifted back to a more multi-functional view. This time with more focus on nature conservation and recreation (Convention on Biological Diversity. n.d.).

Multicultural forests can easier adapt to current climate changes, are more pest-resistant and can help to prevent global warming (United Nations Environment Programme 2011). Forests, that are more developed and drivers in lower layers, are more capable of retention (Jankowski, 2013). A varied forest consists of different tree species and an undergrowth which fit to the local climate and soil conditions. Moreover, such a forest contains trees from different ages. Such forest provides not only habitat for more plants species, but also for a larger range of mammals, birds, insects and fungi. Within sustainable forest management, the harvest rotation should be extended up to 230 or more years (Ecological Foundations of Biodiversity, 2003). Variable density trimmings also help to establish diversity and minimize tree overcrowding (Ecological Foundations of Biodiversity, 2003). Additionally, multiple species of native trees should be planting to promotes diversity and structural complexity in a forest (Ecological Foundations of Biodiversity, 2003). Moreover, undergrowth should be protected during harvesting which will, be carried out in winter to reduce the disturbance. This kind of management can promote a healthier wildlife, increased carbon storage and sequestration, and a more attractive recreational area.

Ecosystem services:

Fig. 4.3.6. Bory Tucholskie
Source: turystyka.wp.pl

4.3.7. CREATE SHELTERBELTS

Shelterbelts are one or more rows of trees or shrubs planted between agricultural fields. Shelterbelts breaks wind and as such prevents soil erosion, and protects crops (Tree Time Services, 20xx). In addition, shelterbelts can be very effective in reducing fire spreading, because they slow down the wind (Austin, 2013/14). Shelterbelts can also protect buildings and decrease energy use within the building (Austin, 2013/14). For this reason, in the past shelterbelts were placed around farms. In certain cases, shelterbelts can even increase the property value for instance when they act as visual screens and are aesthetically pleasing. Additionally, it provides habitat for wildlife.

It is highly important to design shelterbelts properly, because if they are not they can actually have a detrimental impact on farm productivity. There are several key elements to effectively design shelterbelts. They should be oriented perpendicular to the prevailing winds (Johnson and Brandle, 2009). By planting at least one row of high growing species in the shelterbelt helps to make it more effective as a windbreak (Johnson and Brandle, 2009). For maximum efficiency, the uninterrupted length of a shelterbelts should be at least 10 times its height (Johnson and Brandle, 2009). Gaps within the shelterbelts reduce its effectiveness. When the gap is necessary, a small strip of shelterbelt can be planted in front of the gap, or an angled gap can be created (Johnson and Brandle, 2009).

Ecosystem services:

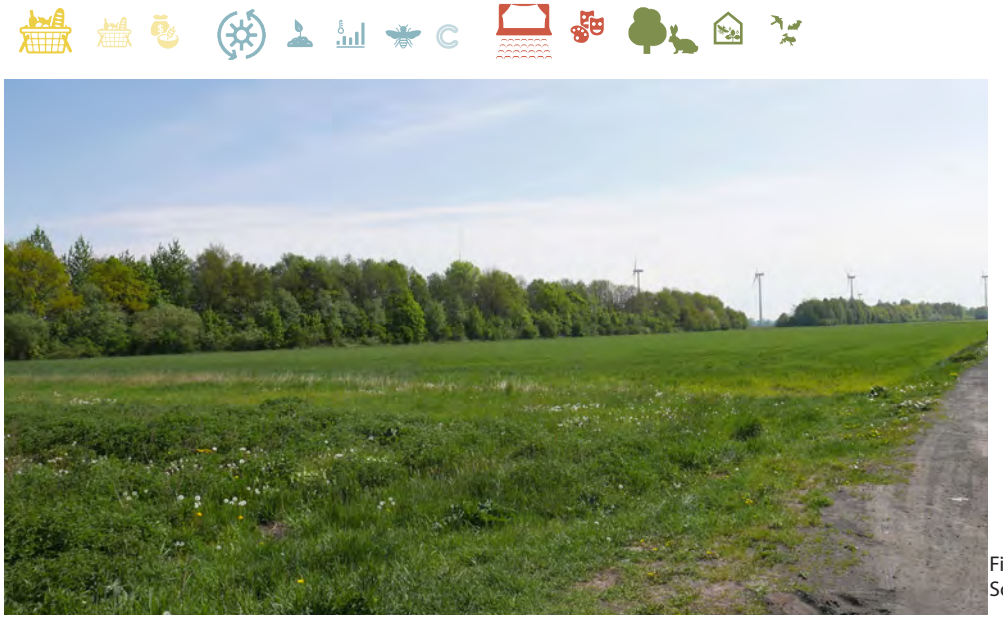

Fig. 4.3.7. Shelterbelts in Zulawy, Wiślina
Source: Olga Nowakowska

5. CONCLUSIONS

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5. CONCLUSIONS

Paper present concept of ecosystem services, their classification as a scientific approach. The analysis of many publications and research projects confirm their beneficial impact for people, animals and the whole environment.

With this study we pointed out three types of areas within Tricity region and diagnosed main problems. The aim of the research was to find natural solutions for those issues. Our team found 33 solutions that allow planners and designers render Baltic cities and communities more resilient, healthier and sustainable. Guidelines were divided into three main categories: greening the urban structure, preserving coast and water, producing sustainable farmland (Fig. 5.1). Some of them are multifunctional and can be use in each category for example permeable pavements, green walls, floating islands or eco-friendly banks. The choice of a guideline to apply should always be selected and adopted to site-specific conditions.

CATEGORY	GUIDELINE		
GREENING THE URBAN STRUCTURE	urban agriculture green infrastructure pocket parks urban gardens green parking lots	green roofs green walls fedges native plant material bees hotels	wildflower meadows bird and bat accommodation floating islands green streets
PRESERVING THE COAST AND WATER	water aquifers natural dune embankments forest retention sewage infrastructure	room for rivers and floods multifunctional flood defences renaturing rivers and streams eco-friendly banks	wetlands bio-retention basins rain water collection permeable pavements
PRODUCING SUSTAINABLE FARMLAND	agriculture tourism organic farming sustainable crop rotation techniques	renewable energy for farm settings biogas production	multi-culture forest shelterbelts

Fig. 5.1. Division of the guidelines of ecosystem services solutions
Source: Author's own work

In some countries the concept of ecosystem services is widely known not only among landscape architects but also planners and architects. Popularization of the knowledge about ecosystem services in other countries is extremely important to enable protection of natural environment. Planners, architects and also residents can rise up their understanding of the importance of nature in the city with a guidance of experts. Presenting a wide range of social and economical benefits and also examples of resident's involvement in care of quality green spaces is the way to convince them to protect natural resources that are the common good of all human beings.

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BALTIC SEA CLIMATE FEVER
CREATIVE SOLUTIONS FOR WATERFRONT CITIES

The goal of the research is to recognize climate change impact on Baltic Sea cities and description of strengths and weaknesses of cities strategies and activities.

The range of research has been limited to 3 cities in the Baltic Sea (Copenhagen, Gothenburg, Tallinn) and Tricity as an area for which recommendations will be proposed actions in the field of adaptation to climate change. Recommendations for Tricity as a unique group of cities that makes up the one urban area with different character should be sufficiently flexible to be able to be a good recommendation for other cities.

The main areas of exploration of universal solutions in the context of adapting cities to climate change are: Quality of air, Sustainable Urban Mobility (SUM) and Water as a specific context to coastal vibrant cities.

Main questions that have been asked to analyse situation in each city in terms of climate change:

- What is the main city problem?
- What is the strategy and what kind of documents it refers to?
- What kind of solution city has been implementing?
- What are the effects of these actions?
- What is still expected to reach?
- The result of research and analysis will be a catalogue of good practices which Gothenburg, Copenhagen and Tallinn applied in order to adapt to the consequences of the expected climate changes. It means that the most creative will be a set of suggestions and ideas for waterfront cities facing the climate change threats.

Mentor:
Pedro Ressano Garcia

Pedro teaches at ULHT Lisbon, where he is Chair of Department of Architecture and Urban Planning. He holds a master degree in Architecture from UCLA. In 2008, he received his PhD Degree from Universidade Portucalense, Oporto. His first book "Tagus Plataform – Back to the River, Lisbon's waterfront and the 21st Century" was published in 2010. In previous ISOCARP events Pedro had the chance to interact and develop ideas with students/young professionals exposed to different contexts and cultural environments. The contemporariness of each generation is revealed over subtle examples that values human and spiritual dimensions. Pedro Garcia is often curious about new parameters.

PhD student: Artur Fojud

Civil engineer - urban designer and urban planner, the auditor of road safety. Long-standing academic lecturer and researcher at Poznań University of Technology. He was awarded by the Ministry of Infrastructure for high and advanced level of his researches in the field of engineering projects and undertakings.

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Graduated architect, freelanced designer, teacher in Sopot University of Appliced Science. "Yacht harbour as a part of city public space" is her research theme. She likes teaching, her subjects are focused on technical drawing, building installations and building constructions for landscape architects.

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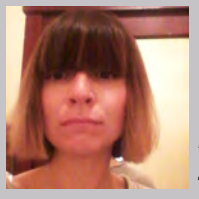
Enthusiastic, open, creative and responsible student of Architecture at Gdansk University of Technology. Always looking for new challenges. Fascinated by public spaces and its atmospheres. Lavishly in love with landscape, nature, vegetarian cooking, architecture magazines and books. Actually working on her master thesis in urban planning.



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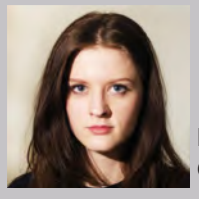

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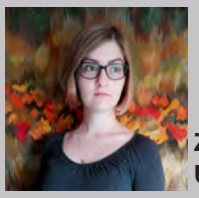

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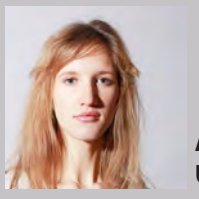

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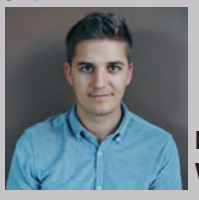

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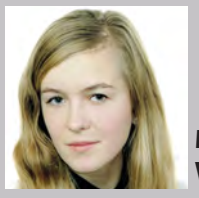

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BALTIC SEA CLIMATE FEVER
CREATIVE SOLUTIONS FOR WATERFRONT CITIES

Pedro Ressano Garcia (Portugal)
Artur Fojud (Poland)
Katarzyna Rembarz (Poland)
Sylwia Różańska (Poland)

1. INTRODUCTION

As the global political and climate situation progress, modern cities have to prepare for demographical and climate changes. The importance of those and limitation of non-renewable energy sources require responsible plans for urban adaptation. Effects of extreme weather or rising water levels are one of the few things today's cities need to handle in order to maintain the quality of life. The awareness of Baltic cities makes it interesting to take a look at the area and scale of their solutions for the tasks of the XXI century. The Project Mentor & Students Research Lab points out the most effective ones that can be adopted by other cities.

1.1. METHODOLOGY

In order to perform a detailed analysis of the needs and possibilities in adaptation of the cities of the Baltic Sea to upcoming and expected climate change and its consequences for the safety and quality of life in cities around the Baltic Sea. The following methodology of research and analysis was adopted in order to identify risks and needs, and solve the problem:

1. Diagnosis of the problem.
2. Determination of the purpose and scope of the research and the selection of research methods.
3. Selection of the reference cities (sample representative of the phenomenon under consideration).
4. Development of the concept of work.
5. Conducting a query containing bibliographic study of literature and the study of knowledge bases in the internet (global search).
6. Analysis of the selected materials with the analysis of the merits.
7. Preparation of detailed research plan.
8. Conducting of the research.
9. Research synthesis.
10. Development of recommendations for the identified problem.

1.2. GENERAL INTRODUCTION ON CLIMATE CHANGE AND ITS CONSEQUENCES IN THE BALTIC SEA REGION

Climate changes are natural process which runs on the Earth. Excessive emission of CO2 which is introduced to the atmosphere by a man and chopping down forests which helps in CO2 reduction interferes natural balance and accelerates process of warming the climate. Scientifics research consists in observation and numerical models of climate changes analyzes but on the actual level of knowledge the process is still very unpredictable.

Global major effects of climate changes listed below can vary in different parts of the World: growth or fall of temperature, heat waves, droughts, desertifications, fires, heavy rains, floods, strong winds, hurricanes, twisters, mudslides, creation of so-called urban breeze and concentration of smog, melting of permafrost and liberation of greenhouse gases, warming up of sea water, rise of sea level caused by glaciers melting, lack of drinking water in areas where it is taken from glaciers or where occurs salinity of groundwater, uplift and falling of lands caused by melting of glaciers and movement of load on the Earth's surface, collapse of the ocean circulation, climate zones movement or disappearance, destabilization of ocean deposits of methane hydrates, extinction of plant and animal species, destruction of infrastructure, starvation, diseases, migration of people seeking better place to live, social and political conflicts.

In the Baltic Sea climate changes are expected in the form of a gradually progressive processes different in the northern and southern parts of the region. The most important phenomena are change of temperature, rise of sea levels, coastal erosion and changes in precipitation. The temperature rise in the Baltic Sea region is larger than the global. The observed average annual temperature rise is 0.11 degrees Celsius per decade in the north and 0.08 degrees Celsius per decade in the southern region. Noticeable is shorten the season of cold, prolonged growing season and greater seasonal and diurnal extremes. This is due to a drastic decrease in the area of occurrence of winter ice cover and its retention period. Smaller and shorter duration of snow and it's earlier melting causes associated with it thaw floods occur earlier and being smaller, especially in the southern regions, where also a trend to drought occurs. Higher temperatures means higher evaporation and consequently more rainfall. In winter, increased precipitation is observed throughout the region, and in the summer mainly in the north. In the southern regions occurs tendency to heavy rains causing floods. Shortening the period of winter leads to longer river activity related to application of the material, which leads to pollution of marine waters, and consequently to increased absorption of solar radiation, warming the surface layer of sea waters and deepen its stratification. The increased flow of fresh water into the sea (rain), increased evaporation and raised temperature of water change the salinity of surface waters. Differences in the process are observed depending on the area – higher salinity in the western part, and the smallest in the northern part. Changes in temperature, salinity, oxygen saturation, Ph and chemical composition of seawater cause an imbalance of the marine ecosystem. The most visible symptoms of these disturbances is eutrophication and changes in the abundance of fish populations. Caused by melting ice to raise sea level is estimated in the range of 0.6m to 1.1m. At the same time as a result of storm surges, water can rise up to 20 cm. The height of storm surges is associated with the severity of the winds, as well as raising the water level. It observed weak tendency to increase the strength of the winds on the open sea.Particular vulnerable to the effects of changes are areas of the coast. The process of uplifting in northern areas due to melting ice and flooding the southern regions due to the shifting waters is observed. Northern rocky coastline is resistant to erosion. Flat and sandy coast of the southern and western are exposed to erosion of sand dunes, cliffs landslides, destroying the edges, taking beaches and storms attacks.

Human activities in the cities concerning counteracting climate change and adapting to them organize themselves around the following issues: reducing CO2 emissions, reducing air temperature, supply of drinking water and protection from flooding as a result of floods and rising sea waters. These activities may be collected in three groups: activities in the field of ecology, mobility activities and activities related to the protection of aquatic fronts.

Fig. 1. Research cities
Source: own elaboration

BALTIC SEA CLIMATE FEVER
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1. DESCRIPTION OF CLIMATE CHANGE ADAPTATION ACTIVITIES IN THE CITIES

In order to examine the adaptation to climate changes of the Baltic cities, those that have a reputation of being vibrant and a high Smart Cities rank were chosen for comparison. That is why apart from the leader of quality public areas and mobility which is undoubtedly Copenhagen we also took Gothenburg – a city which has a strong pedestrian-friendly strategy and very interesting. The third city is Tallinn, an ecological and public transport leader. Three different ways and three different strategies are only inspiration for climate changes adaptation activities. All of the reference cities could be a guide to taking actions in Gdańsk (Tricity), our fourth city of research.

1.1. COPENHAGEN

Copenhagen is the capital of Denmark and a Baltic city located in the western part of Øresund Region. It is the most populated Danish municipality, which covers considerably large areas of Zealand and Amager islands, as well as numerous smaller, both natural and artificial, isles. Copenhagen lies at the coast of the Øresund strait that separates Denmark from Sweden and connects Baltic Sea with the North Sea. Despite the water barrier the city is well connected with Swedish Malmö, metropolitan area located on the opposite shore, by 8 – kilometres long Øresund Bridge.

Fig. 2. Map with Copenhagen
Source: own elaboration

Copenhagen at first mentioned was small village with around 500 citizens in 1150 AC and it was called „Havn". With help of foster brother (bishop Absalon) of king Valdemar, this town expand to 6000 around 1400 Ac and became Scandinavia's largest capital. Then it has change name on „København" which means Copenhagen. With rich history of Vikings, Copenhagen heritage is very wide with art, culture, history and nature. Copenhagen itself since 1400 AC became cultural and educational center of Scandinavian part of Europe. Great legacy of Copenhagen lies in pottery and in the Royal Danish Pottery Factory founded in 1775 by Queen Juliane Marie. It is wise to

mention about maritime heritage which heavily influenced on naval culture of baltic seas. This city is maritime capital of whole Denmark. Today Copenhagen have more than 1.8 million inhabitants living in this area.

Main threats to the city of Copenhagen caused by the climate changes are connected to a general rise of the sea level, storm surges and extreme waves. All these are caused by global mean sea-level rise that according to satellite altimetry based-data comes to 3.3 ± 0.4 mm/year over the period of 1994 to 2010 and keep on accelerating. A high-end scenario of climate change (the so-called IPCC RCP8.5 scenario) projects in Copenhagen a rise of 68 cm (and a 5-95% uncertainty range of 29-162 cm) by the 2100. As 6% of population of Copenhagen lives below an elevation of 2m above the sea level, their houses are exposed to a future danger of disappearing under the sea water. Other vulnerabilities include coastline damages and coastal floods in case of increased risk of storm surges.

City flooding maybe be possible due to excessive amounts of rainwater.Change of the sea level influences as well the functioning of the city sewage system and accessibility of drinking water (as groundwater is its source.

1.1.1. ENERGY POLICY AND QUALITY OF AIR

As Denamark is an insular country and achieves at its highest point of its territory around 170 meters above the sea level, regarding all its civilisation richness, it finds itself in a position of danger caused by global environmental changes. The Danes are known to be environmentally conscious and they are the first country that implemented the first environmental law in 1973.

The capital of Copenhagen aims to become a carbon (production and emission) neutral city by 2025. The Danish Parliament has agreed that by 2020, more than 35% of the total energy consumption must be renewable, around 50% of the electricity consumption must be supplied by wind power and the greenhouse.

ACTIONS

As a result the authorities of Copenhagen published in September 2012 a wide and precise document entitled 'CPH 2025 Climate Plan: A Green, Smart and Carbon Neutral City'. It describes scheduled action that should occur in order to reduce the consumption and production of energy that causes the spread of greenhouse gases, supported by detailed diagrams illustrating the desired directions in progress. What is more the scheduled actions are already being implemented into reality. In order to reduce CO2 emission, new power plants running on renewable energy sources where build or were designed.

Most recent realisations classed due to type of used energy source:

- multifuel: the Avedøre power plant generating capacity of 810 MWe plus 915 MWt for district heating. Unit 1 was built in 1990 and generates only power. Unit 2, which dates from 2001, can use a wide variety of fuels—gas, oil, straw, and wood pellets - for power and district heating; electrical efficiency: 49% and an overall efficiency of 94%;
- waste: Amager Bakke Waste-to-Energy Plant, which is currently under construction in Copenhagen, designed by architectural office BIG. 'The smoke coming out of the chimney is going to come out in the form of smoke rings so you can see how much carbon dioxide emission there is – to make from something uncountable countable.' It provides some further outcomes: recycling, minimizing deposite of waste, added topography - ski slope - creating new

usage and consciousness;
- geothermal: Amagerværket; in 2003 and 2004, two 2.6 km deep geothermal wells were drilled to the Bunter Sandstone Formation. In total the plant can produce up to 27 MW of district heating, split in 14 MW from the geothermal reservoir and 13 MW from the steam used to power the absorption heat pumps. The plant can yearly produce up to 300,000 GJ, equivalent to the annual heat consumption of approximately 4,600 households or roughly 1 % of the total district heating production in the combined area;
- wind: Middelgrunden; wind power plant located 2 km far from the city's coastline. It covers 30% of Copenhagen's energy consumption.

EFFECTS

Assumed effects in Copenhagen are:
Energy production goals for 2025:
1. District heating in Copenhagen is carbon neutral.
2. Electricity production is based on wind and biomass and exceeds total electricity consumption in Copenhagen.
3. Plastic waste from households and businesses is separated.
4. Collection of organic waste for biogas to be investigated.

Energy consumption in 2025 compared to 2010:
- 20 % reduction in heat consumption;
- 20 % reduction of electricity consumption in commercial and service companies;
- 10 % reduction of electricity consumption in households;

Installation of solar cells corresponding to 1 % of electricity consumption in 2025.

Achieved effects are:
- construction of power plants running on renewable energy;
- growing popularity of green roofs;
- 3.6 million tons of waste per year is managed in 340 recycling sites in Denmark;
- reduction in carbon dioxide and greenhouse gases emission comparing to previous years.

1.1.2. WATER AS A SPECIAL CONTEXT TO COASTAL VIBRANT CITIES

Copenhagen will be affected by the global changes in the climate. It is therefore important for the city to be prepared for the climate of the future. Improving water resource management can affect lower temperature for whole city, also preventing flooding by rain and high sea level will contribute to decreasing temperature of air. Climate adaptation is undertaken in stages in relation to the latest knowledge on climate change and the tools for adaptation that are developed in Copenhagen city. Goverment is for many years managing stormwater and the opportunities for recreational use and a better environment in Copenhagen's areas of water.

ACTIONS

Economic consequences of floods - Analyses have been made of the economic consequences of selected flood scenarios. The total cost to society has been calculated in the analyses. Expenditure on loss of earnings, delays and expenditure on renovation of basements/ground floors and replacement of furniture, for example, are included. The real costs will fall substantially if basements are protected by backwater valves beforehand.

Prevention of hotter summers using water - When the city's physical frameworks are modernised

and developed, we will have to prevent the heat effects of the future and take account of factors such as air temperature, sun and thermal radiation, air humidity and wind speed, which are of significance in creating a pleasant urban climate. Creating a Water gardens and green roofs will highly slow down and even stop increasing temperature of city.

Dimensions and capacity of sewers – according to IDA (Society of Danish Engineers) which cooperate with Water Pollution Committee in Copenhagen there is need to change most of sewers system in city. Most of pipes were built more than 150 years ago and their dimensions are not sufficient to nowadays criteria. Most of pipes have life between 50 and 100 years so therefore is need to take action with replacement to new with newer standards.

Prevention of backwater in houses basements – according to Copenhagen forecast for rains and rising sea level there is high risk of flooding basement in buildings located in lower areas of city. There is running campaign that promote installing backwater valves in basements in homes. It can to counteract to backing water from sewer during floods or torrential rains.

Sustainable Urban Drainage System (SUDS) – generally SUDS consists of a number of different elements, all of which serve the purpose of managing stormwater locally. These may be elements that delay/store the water, that treat the water either before discharge to bodies of surface water or percolation of the stormwater. The elements are often "green" and low-technology and will therefore be able to contribute to a greener city, for example in the form of rain gardens, green ditches, lakes and canals. If the rainwater is disconnected from the sewer, the load will fall accordingly. As stormwater during heavy rain makes up most of the water in the sewer, disconnection can have a great effect. The wastewater is roughly distributed one-third household wastewater (black wastewater), one-third stormwater from roads and one-third stormwater from roofs and hardened surfaces in general.

EFFECTS

The initial work on climate adaptation was done with the drafting of the City of Copenhagen Climate Plan in 2009, where the principal challenges were identified and five initiatives were proposed as essential to continued work on climate-adapting Copenhagen:

1. Development of methods to discharge during heavy downpours.
2. Establishment of green solutions to reduce the risk of flooding.
3. Increased use of passive cooling of buildings.
4. Protection against flooding from the sea.
5. Preparation of a combined climate adaptation strategy.

Fig. 3. Section of one of SUDS system solutions
Source: http://www.sla.dk/en/projects/bryggervangen-sktkjelds

Climate-resilient neighbourhood - Bryggervangen and Saint Kjeld's Kvarter is a first Copenhagen neighbourhood which has adapted to Copenhagen Adaptation Plan for Climate change. As a first climate resilient quarter of Østerbro it has been designed by Tredje Natur. This neighbourhood is most resilient to rainfall events because of used technologies as watergardens or bigger amount of green which cause lower temperature in this part of city. Idea is also connected to other green spaces to create green way through Copenhagen - that also will contribute to reduce heat island in city. This project shows to Copenhagen citizens (and also to other cities) that adapting neighbourhood to climate changes can be profitable.

As the Mayor for Technical and Environmental Affairs, Morten Kabell, says:

"We need to make Copenhagen more resilient to extreme rainfall events. This will require

new ideas and solutions, so that we use the rainwater at the same time to create new recreational urban spaces. We need to have less asphalt and more green spaces. That is precisely what is characteristic of the work in the Climate-Resilient Neighbourhood of Østerbro. It can become a great source of inspiration for the rest of the city."

Fig. 4. Bryggervangen and Saint Kjeld's Kvarter Project
Source: http://www.sla.dk/files/1314/2892/9994/Large_Skt_kjeld_1_500.jpg

Copenhagen plans to:

- change concrete areas into green areas,
- improve long torrential rain strategy,
- create strategies for changing flat roofs into green,
- replace sewage pipes in places which are easier accessible for workers,
- to store up to 40k m2 rainwater in one water garden during cloudburst.

1.1.3. SUSTAINABLE URBAN MOBILITY (SUM)

The undeniable contribution of human activities to the climate change forced us to reevaluate factors which shape mobility systems in our cities. In Copenhagen, the environmental impact very quickly became the key element of transport policy. Finding the balance between efficient transport system and low environmental pollution is nowadays one of the general goals for the Copenhagen, along with the aim to become the carbon neutral city by 2025. The importance of those objectives is highlighted by numerous publications and documents provided among others by the local and national authorities.

One of significant examples of such publications is the Copenhagen Climate Plan, which raises the issue of climate change, provides basis for many other documents and indicates specific objectives and initiatives for different fields, including mobility. According to the Climate Plan the main aims of the green mobility are to decrease number of people using cars and to replace the previous technology used in transport by the eco-friendly solutions. Another document, which specifies actions that allow to enhance transport efficiency whilst reducing negative environmental impact, is Traffic and Environment Plan for Copenhagen. The plan covers many subjects and includes diverse actions, which range from enhancing traffic safety to building more cycling tracks. The latter one is also an aim of Copenhagen's Cyclist Policy, an overall action plan which address the cycling conditions and indicates objectives strictly connected with cycling. It shares the similar goal to the Climate Plan, which is to reduce the car usage by providing more opportunities for environment friendly transport. The reduction of car traffic, especially in the area of inner city, is likewise a main priority of another strategy, the Parking Policy.

All of those plans and strategies complement each other and together provide an efficient transport policy. In conclusion, beside the overall goals, stated in the beginning of the paragraph, this transport policy consists of four essential elements:

- integrating public transport and enhancing its efficiency,
- improving the quality of cycling conditions,
- reducing car traffic,
- implementing eco-friendly solutions and technologies in transport.

What is important in case of Copenhagen's transport policy is that the strategies and plans, which are forming it, are systematically implemented. It is one of the reasons why the capital of Denmark is so successful in climate adaptation. Developing an efficient public transport system, which today plays a huge role in reducing the car traffic, would be impossible without systematic, consistent implementation of the co-called Five Fingers Plan. The plan was created in 1947 and for many years was a basis for Copenhagen's spatial planning.[1] The idea was to develop five branches of urban areas centred along transit corridors with lines of S-train and bike paths. Such solution provided possibilities for developing green mobility.

ACTIONS

After decades, when the Five Finger Plan became insufficient for the city, the authorities commissioned for new plan, which would base on green, urban solutions, especially in case of transport. In 2011 was created The Municipal Plan with key elements like creation of transit loop in Øresund region or investments in public transport infrastructure. According to the plan one of the main focuses is transport system, where no more than one-third of trips are by car and the majority of people choose bikes or public transport (History and General Plan, n.d.). The similar idea of connecting Øresund Region by large loop with public transport was used also in the proposal of the Loop City by BIG - a vision prepared as a replacement of the Five Fingers Plan.

The four key elements of Copenhagen's transport policy, which were listed above, are achieved by diverse actions. The city is improving efficiency of public transport by developing the Metro ring, which would increase the number of environment friendly transport users. Creating bus lanes and implementing traffic-light priority for high frequency buses are another methods of enhancing the urban mobility. Copenhagen tries also to follow the rule, which states that majority of population should live within about 300 meters to public transport. The numerous campaigns, like Good Cycle Karma, where cyclist are given small gifts, popularize cycling and the use of public transport.[2] The integration of transport system is accomplished by implementation of online journey planners, one ticket for all transport modes or easy transfer between them.[3]

Another important element in transport policy is the process of collecting information, especially from residents. The Bicycle Account is a perfect example of excellent tool used by Copenhagen to promote cycling, present feedbacks and involve the local community. It is published once in two years and shows the progress of the cycling policy in a very approachable way. Developing and creating new cycling tracks and lanes is another form of action taken in order to increase the number of cyclists. The cycling conditions are improved by widening tracks and creating additional Green Routes, which allows to avoid car traffic by traveling along greenery and parks. The Bicycle Superhighways, which reduce travel time and enable to cycle through city more efficiently is next solution used in Copenhagen. The efficiency and safety of cycle traffic are enhanced by implementation of green wave for cyclist and Intelligent Traffic System (ITS). The city is trying to answer the needs of all users, for example by planning parking facilities for cargo bikes, promoting

[1] History and General Plan, n.d.

[2] Copenhagen Application for European Green Capital 2014, n.d.

[3] The City of Copenhagen, 2014

bike-thru shopping and electrical bikes. A lot of attention is also paid to development of bicycle parking places, especially in the direct proximity of train stations, which would support the idea of integrated public transport and car traffic reduction.[4]

[4] The City of Copenhagen, 2011

The parking policy introduced very strict methods of dealing with car traffic. The city authorities decided to implement pay parking zones in inner city and began slowly increasing parking prices. The amount of regular parking places on streets started to be systematically reduced and replaced by biking tracks, green squares and biking parking places. The necessary parking space for residents was provided by fully automated underground garages and agreement with shopping centre which allowed to use its parking garage outside opening hours. Aside from reducing car traffic the parking policy promotes also use of green technology like solar-powered parking machines or hydrogen and electric cars. The city decided to develop infrastructure for such cars and allowed its owners to use parking places in inner city without paying.[5] Among other initiatives to reduce the environmental pollution is also a plan to implement low emission zones.

[5] The City of Copenhagen, 2009

EFFECTS

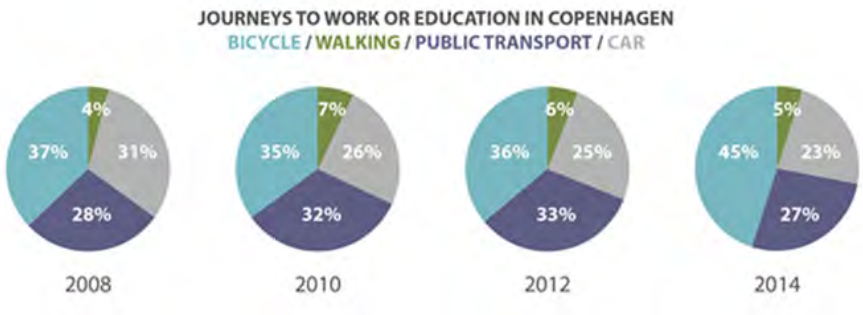


Fig. 5. Copenhagen's Modal Splits from 2008 to 2014 Source: own elaboration based on information and modal splits from Bicycle Accounts (2008,2010,2012,2014)

The effort put by the city and its residents into presented actions triggered very positive outcome. In some cases it was difficult to achieve expected results. For example in case of ensuring that the majority of people have an access to public transport within 300 meters. Nevertheless according to application, which was prepared by Copenhagen for the 2014 Green Capital, the 98% of population still have less than 350 meters to public transport.[6] The modal splits, presented in publications, show that the actions and initiatives increased the amount of people using environment friendly transport modes, especially bicycles. Between 2010 and 2014 the percentage of people, who used cars in their trip to work or school dropped from 26 % to 23 %. At the same time increased the number of cyclists traveling to work or school, from 35 % to 45 %. Such significant change was caused by the effective cycling policy and rapid development of cycling infrastructure. From 2000 to 2014 in Copenhagen were build 61 kilometres of cycle tracks, 18 kilometres of cycle lanes and 27 kilometres of Green Cycle Routes.[7] Another successful initiative was the parking policy, which resulted in noticeable decrease of car traffic in inner city. The P-strategy from 2005 had a strong impact on the transport habits of people living outside area influenced by the parking strategy. A big percentage of commuters, who were traveling to their workplaces from outside the inner city switched from cars to trains.[8] All of those changes contributed to the significant reduction of carbon emission, which dropped by 50 % since 1995.

[6] Copenhagen Application for European Green Capital 2014, n.d.

[7] The City of Copenhagen, 2015

[8] The City of Copenhagen, 2009

There are still many initiatives which need some time before they bring expected results. The most important one is achieving the carbon neutrality in 2025. According to the Copenhagen Climate Plan there are six main points at which all of the actions and initiatives will be focusing. The first point

is dedicated to green technology and alternative means of propulsion. Another two points are the management of mobility and the already mentioned Intelligent Traffic System. The great emphasis will be placed at the public transport and E-mobility. And lastly, a final point is the development of Cycle City.[9] There are plans for even more cycle tracks, lanes and cycling infrastructure. One of the goals is to provide by 2025 at least 3 cycling lanes in each direction on 80 % of the cycling network and thus enhancing the comfort and safety of users. By this time there should already function a new bike share system, which would be an integral element of the public transport.[10] According to CPH 2025 Climate Plan in the next ten years three quarters of citizens would be traveling by bicycle or by public transport, which would be even more reliable, faster and integrated.

[9] Copenhagen Application for European Green Capital 2014, n.d.

[10] The City of Copenhagen, 2011

1.2. GOTHENBURG

The city of Gothenburg is located on the Swedish west coast. The city is today the second largest city in Sweden, with about 510 000 inhabitants, but its origins date back to 1623. The city centre has a classical European character, specified by a dense mid-rise structure with modicum vegetation.

Fig. 6. Map with Gothenburg
Source: own elaboration

The history of Gothenburg begins with the foundation of the heavily fortified town in 1621, during the Thirty Years' War, when Sweden was once-again in armed conflict with Denmark–Norway. In this period the configuration of Sweden's borders made Gothenburg strategically critical as the only Swedish gateway to the North Sea and Atlantic, situated on the west coast in a very narrow strip of Swedish territory between Danish Halland in the south and Norwegian Bohuslän in the north.
Once Sweden had annexed Skåne in 1658, Gothenburg expanded as a trading centre. Boom-time came in the 18th century, when merchant companies like the Swedish East India Company made huge amounts of wealth. From the 19th century, ship building was a major part of the city's economy, until the industry totally collapsed in the 1980s. Volvo's first car wheeled out of Gothenburg in 1927. It's now one of Sweden's largest companies and it's estimated that a quarter of the city relies on the company in some way. Today, Gothenburg is Sweden's most important industrial and commercial city. Most of Sweden's oil is imported through the vast port.

"As the climate changes, Gothenburg will be affected by the consequences. A rise in sea level will produce effects, such as disruptions in power supply, the water and sewage system and the transport system. The problem of low-lying settlements along the river in the centre of the city will be exacerbated by storms that force seawater up into the estuary. Increased precipitation and thus increased volumes of water will also lead to greater levels of erosion, long-term subsidence and the risk of landslides and rockfalls around the river. However, not only will it be wetter in Gothenburg, it will probably also be warmer during certain periods. In the future, there could be a risk during spring, summer and autumn of extremely low water levels in our watercourses, which could result in a risk of landslides due to reduced resistance. Tropical nights, i.e. nights where the temperature does not fall below 20°C, will increase in the future, which could lead to more deaths due to heat stress. Heat will also lead to an increase in the use of energy to cool buildings. To secure the Gothenburg of the future, we need to plan the city in such a way that buildings and the infrastructure can withstand a rise in sea level." [11]

[11] Climate Programme for Gothenburg

1.2.1. ENERGY POLICY AND QUALITY OF AIR

ACTIONS

The city assumes in his "Program for Climate Gothenburg" certain goals that wants to reach gradually.

One of them is undoubtedly the collaboration with industry, which must exist in order to achieve concrete solutions. It is expected in the future, that in 2030 industrial chemistry region Stenungsund will work only on renewable energy, The assumption is that in general the city used a new renewable energy sources - solar, wind, wave, bio, water. A great example already is implemented in life since some time- the production of biogas from waste - GoBiGas -Gothenburg Biomass Gasification Project. This project is used by a local manufacturer of energy.[12]

[12] Biogas - a speciality of western Sweden

Already, the city has a plan of waste, which implies that at least 50% of food waste is to be used for biogas production. They are organized for this purpose special waste collection, food, attaches great importance to the efficient sorting - putting the right amount of garbage containers and specialized (also riding on biogas), collecting the waste. It is assumed that in 2030 the city will be able to produce energy only from renewable energy sources.

Saving energy produced is another important objective. Increasingly popular are settlements, passive houses, which themselves produce for themselves the necessary energy. The program "Celsius – district heating for boats" involves heating the boat with heating network when it is moored - heating formed as "waste" in the city. And backing for the project "Celsius – district heating for domestic appliances" - instead get heat in the washing machine, dryer electricity - use of district heating network. Gothenburg is a world champion of district heating and cooling (DHC). The current "energy mix" of Gothenburg's district heating system is now 74% recovered heat, 18% renewable energy and 8% fossil fuels, most of it produced through cogeneration.[13]

[13] Investor reporting 2014

To solve or even with substantially mitigating the problems of water scarcity, built Lackarebäck - the largest in Scandinavia ultrafilter treatment and purification of water, which is an independent microbiological barrier. [14]

[14] Investor reporting 2013

As the port of Gothenburg is the largest in Scandinavia, it is very important actions to minimize water pollution. For this purpose, the port policy of fees for ships that use fuels with a sulfur content greater than 0.5%. These fees are earmarked for further environmental initiatives shipping.[15] CO2 emissions of shipping ports is to reduce by 2030 at least 20% compared to 2010.The city has undertaken that by 2035 will reduce emissions of CO2 from 8 to 3.5 tonnes per capita. Ultimately, in 2050 this number is expected to be 1.9 tonnes per capita per year.

[15] City of Gothenburg

The city has undertaken that by 2035 will reduce emissions of CO2 from 8 to 3.5 tonnes per capita. Ultimately, in 2050 this number is expected to be 1.9 tonnes per capita per year. The energy used in homes will be reduced at least 30% and electricity consumption, excluding industry and transport will be reduced at least 20% by 2020, taking 1995 years as the base year. What is not often seen, the city also calculates the amount of emissions that the city produces indirectly - eg. long air travel residents, bringing exotic food products. And so the effect of food on the climate (mainly pork meat products, poultry and fish and dairy) in 2030 will be reduced by 40% compared to 2010.[16]

[16] Climate Programme for Gothenburg

EFFECTS

The city has already a plan of waste, which implies that at least 50% of food waste is to be used for biogas production. They are organized for this purpose special waste collection, food, attaches great importance to the efficient sorting - putting the right amount of garbage containers and specialized (also riding on biogas), collecting the waste. It is assumed that in 2030 the city will be able to produce energy only from renewable energy sources.

A great success of the city was to invest in energy solutions - Gothenburg is a world champion of

district heating and cooling (DHC). The current "energy mix" of Gothenburg's district heating system is now 74% recovered heat, 18% renewable energy and 8% fossil fuels, most of it produced through cogeneration.[17]

[17] Gothenburg champions district energy in Europe and worldwide

1.2.2. WATER AS A SPECIAL CONTEXT TO COASTAL VIBRANT CITIES

Gothenburg city wants to cope with climate change by being restrictive in building on low- lying areas, but the low- lying areas are close to the city centre and attractive for building. Important buildings and constructions in the city centre are at risk of flooding when the sea level rises. It seems like Gothenburg is more heading for flood resistance, building high floodwalls to prevent from flooding with a certain return period, instead of building a flood resilient city, with floodable areas in strategic places.

ACTIONS

The sewage systems in Gothenburg was built in early 1900's, with British influences. The system in Gothenburg has been developed along with the city expansion. Until 1958, combined sewage was still constructed. From 1958, all new areas were built with separate system. In the 60's and 70's there was a focus on reconstruction of the old, combined system to separate system, but this was stopped in the 70's due to high costs and, as mentioned before, 20% of Gothenburg has still combined system. Many parts of the city were built on former marshland area in city, close to the sea. Gothenburg city struggles with rising sea level in the future and has seen a few severe flood events in the last years.

As a part of the work with the EU directive, 2007/60/EC, Swedish Civil Contingencies Agency (MSB) has finished an assessment where Gothenburg is considered as one of the 18 Swedish cities at risk of flooding (MSB, 2011). Gothenburg is one of seven cities matching all five criteria in the assessment. Higher precipitation and sea level rise are expected in the future due to climate change (Göteborg Stad, 2009).

SMHI made a mapping of flooding from Göta River in 2000 and Mölndal River in 2008. According to the SMHI (2000) and SMHI (2008), Gullbergsvass in central Gothenburg is at risk of getting flooded by the Mölndal River with a return period of 100 years. The central station, the railway and several buildings along Mölndal River are situated in the risk area. The analysis where conducted with a 1D-model with interpolation of the water level on the surface with a rough digital elevation model (DEM). According to MSB (2011), 2,800 persons are living in the area that would get flooded by a 100-year flow in Göta River. 21,000 persons are working in the same area.

No general mapping of flood risk from heavy rainfall have been done for Gothenburg. However, several minor studies have been conducted for smaller areas of interest, leading to a good overview for the city planners (Ljunggren, 2013).

In 2006, Gothenburg Municipality made an assessment of consequences of flooding from the sea (Göteborg Stad, 2006). They came up with a minimum level under which no new building are supposed to be built. They also suggest building a pilot test area with the principles of SUDS (sustainable urban drainage system). This area is suggested to be Södra älvstranden, Norra älvstranden or Gullbergsvass, which are low-lying areas. Other topics on the agenda are to spread awareness among all branches of the municipality, find out how to protect valuable constructions, show the river flow on the Internet, make a risk assessment of the city and to make responsibilities for climate change effects clear (Göteborg Stad, 2010).

EFFECTS

The traditional resistant flood strategies (since early 1900's) try to prevent the water from reaching urban areas by stopping it in various ways, such as protection walls and pumps. Also city is being restrictive in building on low- lying areas.

The Gothenburg municipality is investigating resistant flood strategies such as barriers across and along the river. These infrastructures have high failure risks and are very expensive.

1.2.3. SUSTAINABLE URBAN MOBILITY (SUM)

As Gothenburg is a transport-intensive metropolitan area it is facing major challenges to reduce greenhouse gas emissions resulting from transport. Because of the fact that the transport of people and freight passes largely through Gothenburg it gives the city a potential to influence development both at the local level and nationally or internationally.

As an industrial city with Scandinavia's largest freight port, Gothenburg generates a high number of transport movements and high emissions, making its climate plan even more impressive.

But in the eyes of climate planners and the city government it is not just facing a challenge but also an opportunity to reduce greenhouse gas emissions generated in Gothenburg and in Sweden. The industry makes there endless opportunities enabling Gothenburg to find innovative solutions in cooperation with the city companies. The most important areas of interest in the mobility strategy for the city are: transport efficient society, cycling and public transport facilities, fuels with low climate change and policy instruments.

ACTIONS

1. Transport efficient society
The Gothenburg city makes it clear that urban planning has an important role to play in creating a transport-efficient society. Strategic planning is there the primary tool. It means that the city should be planned in a way to make it simpler and more obvious to choose climate-smart means of transport, for example more people on the same area and with a reduced need for transport. The city of Gothenburg understands that waste and freight transport also should be incorporated into city planning at an early stage. For example heavy road traffic is particularly noticeable in Gothenburg, which has the biggest port in the Nordic region and a lot of industry. The heavy goods traffic affects the city's local environment with poor air quality. That is why the Port of Gothenburg invests more and more in increasing the proportion of goods carried by train which is possible thanks to new rail shuttles to and from the port.

2. Cycling and public transport
It is significant, that approximately one-third of carbon dioxide emissions in Gothenburg come from the transport sector. Until today there was a large- scale development of alternative energy sources for vehicles but according to the surveys this will not be sufficient. The Gothenburg city wants to reach the target of 80 percent lower carbon dioxide emissions that results from traffic. According to the Transport Strategy if this is supposed to happen there is required a reduction in road traffic of 25 percent. This strategy can be implemented by providing good alternatives to the car by creating attractive environment for pedestrians, cohesive cycle path network and investing in a well-developed public transport. The car will still has a role to play there although not that

much in a day-to-day travel. There is also a big importance of developing and producing travel services, such as carpools and bicycle pools. Today the bike-borrowing locations are getting more and more popular among both citizens and tourists in central Gothenburg. There are 1000 cycles there and not fewer than 60 stations at 300-500 meter intervals. The stations are located in places that are close to public transport junctions and places where people most frequently pass by. The main point there is to create a society where all road users are treated more equally.

The aim of the City of Gothenburg is to transform municipal transport into a more efficient one and to increase the use of renewable energy. The strategy is implemented in many different ways, for example by using electrically powered vehicles or supporting renewable fuels and energy-efficient hybrid. As the city has a strong industrial and academic sectors willing to cooperate with the city it is possible to create there a test arena for new technology and innovative solutions.

In Gothenburg the cooperation of "Electricity" gathers among others participants like Volvo Group, Region Västra Götaland, City of Gothenburg, Chalmers University of Technology, Swedish Energy Agency, Johanneberg Science Park, Lindholmen Science Park, Business Region Göteborg. Industry, researchers and society are there working together to develop, test and demonstrate sustainable public traffic for the future. The cooperation of Electricity has launched in 2015 Gothenburg's first route for electric buses, which are 100% emission free and run on electricity from wind power and hydropower. The concept vehicles developed by Volvo Buses is about 80 per cent more energy-efficient than a conventional diesel-powered bus. Apart from the three all-electric buses, the route 55 is also served by seven hybrid buses powered by electricity for about 70 % of the route.

Another cooperation that is essential for sustainable transport in Gothenburg is Gutabolaget that has an assignment for coordinating vehicles and transport solutions. They lease out vehicles that are powered by renewable fuels and electricity, such as cars, vans, small buses, trucks and electrical bikes to Gothenburg administrations and municipal companies. Today the passenger car fleet consists of 97 per cent green. The Sweden's first public filling station for liquefied biogas and natural gas was opened in Gothenburg in 2010. Biogas and natural gas is used there as a fuel for over 15 years, being used to fuel Gothenburg's over 120 gas busses. In the city there is located 14 public filling gas stations.

As part of the Västra Götaland Region there are made demands on vehicles used in public transport in Gothenburg. The basic requirement is that the vehicles that are purchased or leased should be the more environmentally adapted models on the market. By continuing to tighten demands in conjunction, it is possible to speed up the development of new, environmentally adapted technology.

Apart from providing good alternatives for cars, the development of policy instruments is a key issue to reduce car traffic. In order to reduce car traffic the city of Gothenburg has worked with gradually raising parking costs and congestion charges. The strategy creates an economic driving force that ensure that more people choose not to use the car if they do not have to.

The congestion tax in Gothenburg is a tax levied on most vehicles entering the central part of the city including main roads passing by the city. The main aim of the congestion tax is to reduce car traffic in the city and to get financing for large road and rail projects in Gothenburg.

Gothenburg is also responsible for a large number of transport vehicles, such as waste collection vehicles, travel service vehicles and vehicles used for the distribution. By separating the transport from the product it is easier to impose demands on transport provision. The city of Gothenburg

helped to launch Stadsleveranses (the City Delivery) to pool together deliveries for shops within a zone stretching about 10 streets. Private transport companies leave their packages at a terminal in the downtown from where Stadsleveranses's fleet of electric cars carry the goods for couple of kilometers to the final destination. Another policy instruments that had been there implemented in 1996 are Low Emission Zones. The approach is that all vehicles over 3,5 tonnes that are older than 8 years old are banned, including buses. A further plan of policy instruments that will in time reduce climate impact is lowering speed limits in the city and develop some bonus systems for reduced car traffic.

A quite important issue for the city is to promote acceptance of economic policy instruments by clearly communicating the purpose.

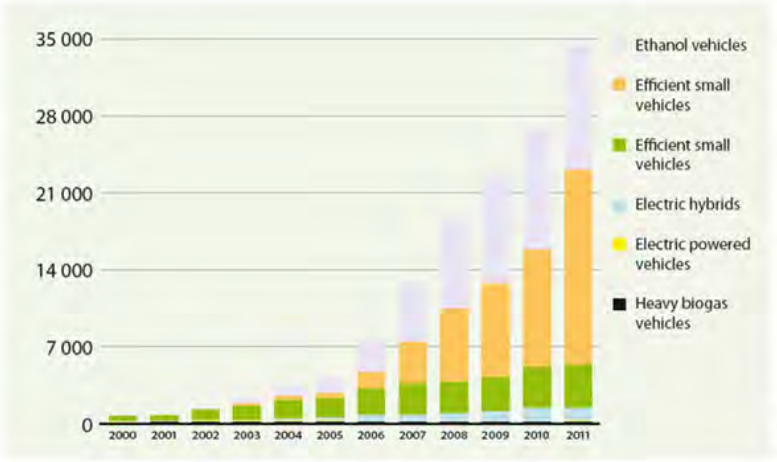
Fig. 7. Paying tolls in Gothenburg 2013
Source: Transportstyrelsen, https://gupea.ub.gu.se/bitstream/2077/36092/1/gupea_2077_36092_1.pdf

EFFECTS

Thanks to the summary of operations taken by the city of Gothenburg plus industrial and academic sectors of the city there are noticeable some changes. Between 2006 and 2014 there is a decrease of people using car and an increase of people who reach their places by walking.

Also there is a visible development of clean vehicles in Gothenburg between the years 2000 and 2011.

Thanks to new rail shuttles to and from the port of Gothenburg the proportion of goods carried by train changed significant. In 2000, a total of 22 percent of all containers were transported to and from the port by train whereas in 2009 the proportion has passed 50 percent.



The development of clean vehicles in Gothenburg 2000 – 2011.

Fig. 8. The development of clean vehicles in Gothenburg 200-2011
Source: https://goteborg.se/wps/wcm/connect/56df040d-3044-43fc-80bc-f80929ca8ae8/Promote_Clean_Vehicles_in_Gothenburg.pdf?-MOD=AJPERES

The most important goal to achieve for Gothenburg is that by 2030 carbon dioxide emissions from road transport within the Gothenburg geographical area will decrease by at least 80 percent compared to 2010, whereas emissions from shipping within the Gothenburg geographical area will decrease by at least 20 percent.

1.3. TALLINN

Tallinn is is the capital and largest city of Estonia. It is situated on the northern coast of the country, on the shore of the Gulf of Finland, 80 km (50 mi) south of Helsinki, east of Stockholm and west of Saint Petersburg. Tallinn occupies an area of 159.2 km2 (61.5 sq mi) and has a population of 440 597. Approximately 32% of Estonia's total population lives in Tallinn.

Fig. 9. Map with Tallin
Source: own elaboration

Tallin nowadays is the largest political, financial, cultural, educational centre and the capital of Estonia. First reliable account about the city comes from 13th century when Tallinn became a target for the expansion of Kingdom of Denmark during the period of Northern Crusades. Because of its strategic location Tallinn became rapidly a major crossroads for trade between Scandinavia and Russia. In 1248 became a member of the Hanseatic League, medieval trade network. In that time it was one of the best-fortified cities in Europe. During next centuries Tallinn had to survive many periods of conflicts and occupations. Wars and bombing led a new periods of buildings but the Old Town still largely retained its charm. Nowadays Tallinn is trying to celebrate medieval past, specially that old fortifications are preserved and defensive spirit of the city is still perceptible. In 1997 UNESCO reward Tallinn's Old Town a World Heritage Site, what made it a huge touristic attraction and lucrative business for the city.

Flooding and erosion and loss of coastal eco-systems are the main Tallinn's climate threats. Tallinn has been identified as an area of high risk to erosion. Coastline areas are generally densely populated or subject to intense construction activities and at the same time they are extremely vulnerable to storm surges. For Tallinn specifically, long-lasting north-westerly winds and storms are most unfavourable and time series have shown an increase in their strength and duration .
The coastal zones are characterised by many flat low-lying bays containing valuable coastal eco-systems such as extensive areas of coastal wetlands. These vulnerable areas are not protected by means of coastal defences as erosion and coastal flooding.

1.3.1. ENERGY POLICY AND QUALITY OF AIR

Urban policy, strategies and development plans of Tallinn are defined by the following documents indicating the actions suggested in order to achieve appropriate results.

1. First of all, in Tallinn in 2009 was signed the Covenant of Mayors, which requires the city to reduce CO2 emissions by 20% by 2020. To achieve this objective created * "Plan of Action for Sustainable Energy 2011-2021", which deals with growth energy efficiency, thanks to the coverage of 20% of energy consumption from renewable sources.
2. "Action Plan of Tallinn Environmental Protection for 2013-2018" In referring to the renewable energy sources for heating.
3. The Action Plan on energy efficiency in Tallinn, was developed for the period 2010 to 2020

analyzes the saving potential and determines guidelines for the development of economy, energy, and its main purpose is to reduce greenhouse gas emissions and increasing the share of renewable energy sources.

4. Development plan of Tallinn for 2014-2020. The development plan is based on the development strategy Tallinn entitled "Tallinn 2030" .Describes plan for the development of individual districts, their strategies, budget and comprehensive plan.
5. "Tallinn Environmental Strategy to 2030", which presents concepts and directions of sustainable development. The key objectives and strategies are as follows:

- preservation of natural diversity and enhancement of biodiversity;
- development a complete and optimal network of green urban areas;
- management and protection of the aquatic environment;
- improvement of air quality;
- reduce the amount of waste and recycling them in the environmentally friendly way;
- raising environmental awareness;
- the creation of urban spaces with the aim of a healthy environment for life.

ACTIONS

1. Energetic efficiency

- "fix facades" - since 2010 Tallinn implementing the project "Fix facades", consisting in the reconstruction of existing buildings built before 1993 for more energy efficient (insulation of facades and roofs, replacement of doors and windows, replacement of heating systems and ventilation) to reduce energy consumption. From 2010 until 2014 Tallin support the reconstruction of 123 townhouses to the value of 1.709 million euros. However, in 2015, has a total score of 268 residential buildings.From 2015-2020 the city plans to rebuild 400 residential buildings, with help of the European Union Cohesion Fund;
- organization of energy saving days - the main purpose of energy-saving days is to familiarize citizens with effective and simple methods of saving energy. For example, turn off electrical appliances rather than leaving them on standby can save 10-15% of electricity. Recommendations related to energy efficiency will be introduced in schools, businesses, recreation centers and nursing homes;
- training for entrepreneurs- the main objective of this training is to advise entrepreneurs on how to best take advantage of opportunities to save energy during production processes and offices,
- energy-saving in every enterprise - it is necessary to implement energy-saving technologies and solutions;
- display of energy efficiency improvement measures in any development program - Tallinn has a number of development programs, which indirectly contribute to improving energy efficiency. They point the way energy supply and the level of its demand before and after implementation of activities;
- improving cooperation - the city must coordinate cooperation between entrepreneurs and local governments in the promotion of energy saving measures in order to avoid ambiguous situations in which the work on the way to save energy are duplicated or are moving in the wrong direction;
- the designation of posts and officials responsible for the implementation of energy efficiency the city sets of specialists from different departments who will be responsible for matters of economy and energy savings. The city is to have the Department of Energy, or a specialist, who will coordinate and take control efficiency energy economy.

2. Renewable energy

In recent years, Estonia recorded an increasing share of renewable energy in a totally consumed.

The energy from these sources can be used to produce electricity, heat and motor fuel. Biogas is released after the fermentation of organic waste. Depending on the environment, biogas contains 50-70% methane and the heating value is 5-7 MWh / 1000 m3. In Tallinn, the biogas is produced and used in the following places: Pääsküla used the biogas from 1993. Firstly biogas was used as fuel in the boiler, but since 2001 has also been used in a gas engine to produce electricity. After the closure of the landfill in the previous year, the maximum efficiency of biogas was up to 1000 m3 / h, and the annual output exceeded 5 million m3, which provides heat to 1,000 homes in Pääsküla. Biogaz is used to produce heat and electricity. The heat is transferred to the heating network as Tallinn forged, and the corresponding energy is transmitted to Eesti Energia as a network of power.
Paljassaare wastewater treatment plant maximum utilization of biogas and wastewater residual heat in wastewater treatment plants - the implementation of biofuels refueling.

3. Heat economy
The supply of heat to buildings is one of the most important opportunities for energy saving. Renovation of existing buildings can save up to 30% energy. New buildings must meet the requirements of the EU Directive:

- energy audits, thermographic testing and certification of energy - Renovation and insulation of housing;
- construction of housing with high thermal resistance;
- expansion of the use of heat pumps, especially in areas with low population density;
- the use of solar energy;
- renovation of heating networks and pipelines exchange of pre-insulated pipes;
- connection to district heating networks between the Eastern and Western districts in Tallinn - maximum use of electricity generated in Tallinn Power of biofuels;
- renovation domestic boiler and construction of local power and heating plants;
- maximum use of biogas and wastewater residual heat in wastewater treatment plants - the implementation of biofuels refueling.

Tallinn power plant (vào), which belongs to AS Tallinna Kute.Jest environmentally friendly, uses local fuel, ie wood chips and peat. The plant produces 8-10% of the electricity consumed in Tallinn, as well as a quarter of the heat supplied to the district heating network of the city. The creation of the Department contributed to reduce the use of fossil fuels in the energy supply to Tallinn.

4. Waste management
Significant changes have occurred in waste management through more efficient sorting and utilization- in 2014. waste incinerator was built, which processes about 20% of household waste and produce energy for district heating network.

5. Smart city
eGovernment, which results in less paper consumption.

EFFECTS

The city has an obligation to reduce CO2 emissions by 20% by 2020, resulting in a 20% improvement of energy efficiency and a 20% share of renewable energy sources in the energy balance.

1. Energetic efficiency

- "Fix facades" reducing CO2 emissions by 90,000 tons by 2020.
- All new buildings will be designed and built according to energy efficient building standards.
- Consumer reducing energy consumption and saving tens of crowns a month, and then electricity

consumption in Estonia will decrease by 10%.
- Reduce consumption of oil shale by one million tonnes per year, so the amount of CO2 emissions will be reduced up to one million tonnes respectively.
- Training for entrepreneurs.
- Implementation of the technology and energy-efficient appliances.
- Replacement of old production equipment and motors with low energy efficiency of new and advanced.
- Determination of positions and officials responsible for the implementation of energy efficiency
- Efficient and effective implementation of these organizational measures enables energy savings of 2-3% per annum.

2. Waste management
Processing approximately 20% of household waste in a waste incineration plant, which produces energy for the heating network.

3. Heat economy
Heat Energy- 42% comes from renewable energy sources.

1.3.2. WATER AS A SPECIAL CONTEXT TO COASTAL VIBRANT CITIES

In Estonia, the most vulnerable areas to storm surges are the shallow and narrow bays of Pärnu, Matsalu and Haapsalu, which are exposed to the strongest storm winds in the Baltic Sea region. Maximum relative sea level rise by 2100 is estimated to vary from 0.9 m in southwest Estonia to 0.7 m on the northwestern coast due to different velocities of land uplift in the studied areas.
In the development of the urban space in Tallinn, the objective is to receive the European Green Capital title by 2018, thanks to the creation of an integrated green network and the improvement of the quality of water and air. It is also important to make the city centre more compact, preferentially develop coastal areas and turn former industrial sites into public spaces.

Although, according to the conference Infrastructure and Energy Sector Adaptation to Climate Change in Tallinn on 20 March 2015, there is a crucial gap in Estonia's policy framework: the current national environmental strategy, valid until 2030, does not include goals or activities on climate change adaptation. The adaptation strategy should be ready for adoption by mid-2016.

ACTIONS

Ideas for waterfront development are focused on: military, cargo, passenger ships, commercial, warehouse, recreational and housing.

Map of areas which could be potentially threatened by floods if the sea level were to rise is meant to help the local government plan for emergency situations. Present development plan for Tallinn for years 2014-2020 shows general plan of options for climate change mitigations:
1. Consistent communication with city residents through the media and other information channels about the necessity for a sustainable and environmentally friendly way of life and the providing of appropriate sources of information.
2. Continuous development of sustainable attitudes in city residents of all ages – from children to the elderly: raising awareness in nursery schools and schools, organising or supporting the organisation of events, involving the elderly in the dissemination of information and in the organisation of relevant events.
3. After the climate change adaptation framework has been created on the European Union level, Estonia, including Tallinn, shall compile local climate change adaption strategies.

4. Consistent implementation of the commitments stated in the Covenant of Mayors of the European Union, signed by the Mayor (to minimise the causes of climate change and to mitigate the consequences of current activities).
5. Increasing climate change response preparedness, which means the analysis of possible negative future scenarios and, if necessary, the preparation of additional studies and long-term impact estimations.
6. Candidacy for the European Green Capital Award.[18]

[18] Tallin Development Plan, 2014-2020

One of the climate changes mitigation proposal was use of more durable construction materials for better resilience to storms, and better readiness to respond when, for example, trees felled by storms damage overhead power cables.

Tallinn Environmental Protection Action Plan 2013–2018, which was prepared for the implementation of the environmental strategy of the city, includes the objective that research and scenarios must be used to identify the impact of climate change and the potential cost, which would be followed by the development of an action plan for adapting to climate change.

Continuously monitored the environmental status of water, and the ecological status of the studies are considered poor, or even bad (Pääsküla river, lake Harku). A large proportion of the pollution comes from major waterways drainage basin extends outside of Tallinn (Ulemiste Lake, Pirita River). The goal is to renovate a water supply underground system. Analysis and plans are based on different actions and climate changes danger. Water supply system based on rainwater is considered as one of strategic decision. Unused post-soviet system in military and industrial areas is mentioned as a risk of surface and underground water quality. Climate changes probably will result in rain increase. Tallinn is a city vulnerable to flooding. Long coast and lack of green areas can affect with periodic flooding. Increased flooding and storms pollutants migrate to the Baltic Sea are two of main problems to consider.[19]

[19] Tallin Environmental Protection Action Plan, 2013-2018

Tallinn Environmental Water Strategy to 2030 assumes objectives:

1. The improvement of the ecological and physical-chemical condition of major water bodies in Tallinn - with the aim of at least achieving an acceptably good ecological condition. The preservation and improvement of the natural diversity of bodies of surface water.
2. The improvement of the ecological and physical-chemical condition of major water bodies in Tallinn - with the aim of at least achieving an acceptably good ecological condition. The preservation and improvement of the natural diversity of bodies of surface water.
3. The organisation of the more efficient protection against contamination of the catchment area around Lake Ülemiste as Tallinn's surface water intake system.
4. Supplying high-quality drinking water to inhabitants and other users and promoting sustainable water use.
5. The preservation of groundwater reserves and ensuring their protection and quality.
6. The preference for the use of groundwater in areas that have already based their water usage on a groundwater supply, preventing a decrease of its use on account of the presence of surface water. An increase in the role of the Ordovician-Cambrian aquifer in supplying the population with drinking water (to the extent of groundwater resources that are assigned to the city).
7. The creation of a groundwater-based water supply system covering the entire city for critical situations.
8. The achievement of good conditions for Tallinn's coastal waters, making sure they are as close to natural as possible. A decrease in the pollution load discharged into the sea from the mainland. A decrease of the eutrophication of coastal waters.
9. City space near the sea is open.
10. An achievement of good ecological conditions in rain water recipients by 2021; namely, the

city's coastal waters and inland water bodies. An improvement in rain water quality.
11. The prevention of floods and the mitigation of consequences.
12. Treatment of rain water as a natural resource to be accumulated and used in a reasonable manner (primarily accrual-based use of rain water).[20]

EFFECTS

[20] Tallinn Environmental Water Strategy, 2030

Several activities that are stated in the Environmental Strategy 2010 have been implemented in terms of the protection of the Lake Ülemiste and the city's surface water intake. The project to create a sanitary protection zone for the water intake of Lake Ülemiste has been prepared and a new sanitary protection zone has been established around Lake Ülemiste. The construction of the Lake Ülemiste shore protection scheme and the erection of a fence around the sanitary protection zone for the lake has been started.

The water monitoring system has been improved. Water consumption has been reduced and the quality of rough water in Tallinn's surface water intake has improved somewhat.

As at 01.01.2011, sixteen watercourses (including a river, streams, main ditches and other ditches) with a total length of 325.4km which are located in Tallinn have been entered into the National Environmental Register. In public use are the Pirita (partially) and Pääsküla rivers, and the Tiskre, Harku and Kurna streams (excluding those that fall into the Lake Ülemiste sanitary zone).

The status of coastal waters has generally improved over the years and water quality of bathing areas conforms to requirements, but achieving ecological balance is a much longer process.

One of the main objectives of the Environmental Strategy was to establish a public sewerage system in the city of Tallinn, since in 1998 several districts lacked a sewage system. Today, almost all water of the entire city has been canalised, significantly reducing the direction of waste water into rain water systems and making rain water cleaner.

Measures of long-term interventions are strongly connected with better use of water in the city. In general the plan consists on:
- the development of international cooperation with all Baltic countries in order to achieve the good condition of the Baltic Sea,
- improvement of surface water,
- protection and use of water in the catchment area,
- ending the unauthorised discharge of waste water into rain water systems and water bodies, and an increase in supervision,
- the construction of rain water pre-treatment plants,
- drafting an activity plan for the transfer of the whole of Tallinn to a groundwater supply in an emergency situation,
- the construction of new bore well pumping stations which draw water from the Ordovician-Cambrian aquifer,
- drafting a strategic plan for building activities in coastal waters,
- the development of a plan for the mitigation of flood risks,
- drafting a rain water strategy.

1.3.3. SUSTAINABLE URBAN MOBILITY (SUM)

In Estonia, during recent years, more attention has been paid to sustainability aspects in planning

and transport development and the steps towards an approach to sustainable mobility planning have been taken. The Estonian government policy has emphasised the need to improve connections between major roads and international ports and airports, that the changes in transportation could be made in the scale of the whole country and baltic area. The transportation in Tallinn also needed some improvements. Department of City Planning in the term of sustainable development started to organize a model of mobility system and transportation in Tallinn. Changes which are visible now in the city are the consequences of consultations and developments of strategies year by year.

Environment Department of the city created a strategy of Green City Tallinn which combines many actions. Together they are making a huge model development for the future to make the city more aware of the climate change. The main policy documents regarding transport are the Transport Development Plan 2006-2013 and the Public Transport Development Programme 2006-2010. The most important objective of transport policy is that the transport system must ensure the mobility of people and goods while being effective, safe and environmentally friendly.[21] The rapid growth of car use is the problem of every big city. Urban sprawl made people lazy and increased the use of cars what resulted in traffic jams in the morning and evening peak hours. The level of CO2 emissions in Estonia is significantly above the EU average mainly due to the specifics of electric energy production (oil shale burning). Negative effects caused by transport cannot be ignored. Approximately 16 percent of greenhouse gas emissions in Estonia are produced by transport, 66% of it by road transport.[22] Creating Sustainable Urban Mobility Plan SUMP will be the most important step for Tallinn in terms of transportation and changing the city's organisation and the budget. The government is also educating citizens and trying to explain that their habits can bring dangerous consequences if they are going to continue their lifes they are living now. Because of that Tallinn is the only city in Estonia, which uses the environmental electric transport (trams, trolleybuses and electric trains). This is part of the sustainable mobility program which is one of the keys to get the award of Green Capital in 2018.

[21] Tallinn development plan 2014-2020

[22] Sustainable Transport Perspectives for Estonia

ACTIONS

1.Free public transport for the citizens of Tallinn
The government made public transport available and free for every citizen of Tallinn. This program started at 01.01.2013 and is combining buses, trams, trolleys and local commuter trains. These facilities are paid just for tourists and visitors. This action is guaranteeing mobility for unemployed and low income residents. Using public transport citizens are sharing common space for different segments of the society. The main purpose of the economical point of view was the idea of increasing a labor mobility in the city limits and stimulating consumers activity. Strategy is predicting that savings from public transport in the future can be spent for local goods and services. Modal shift from cars to public transport can create more urban spaces. This will bring less noise pollution and cleaner air. The strategy should create a strong motivation to register place of residence and stay in Tallinn for longer, maybe for the whole life.

2. Separate traffic lanes for public transport.
Very positive aspect and a good way to convince citizens to use public transportation more often. People are not losing time in the traffic jams in the city centre.

3. More bicycles roads.
Statistics in the yearbooks prepared by city government are showing that every year there are more kilometres of build cycling roads in the city. Tallinn is planning new ones to promote this type of transport and show to citizens how it can be convenient and affordable for everyone. The network of cycling roads is growing and there is more and more citizens who started to use a bicycle instead

of a car to move around the city. In 2000 there was 65 km of the bicycle roads, in 2015 there was 254 km.

4. Bikeep system.
Parkings for bicycles located around the city. They are working 24 hours and are easy to track. System is providing digital map where you can find where is the nearest bicycle station. Bikeep is also taking care of safety and because of that they installed cameras and blockade system.

5. Park&ride system.
In the park and ride parks citizens of Tallinn can park their car on the outskirts of the city free of charge and easily travel to the city center by public transport. This system is good for environment and also can help people to save money. Also it is reducing stress from standing in traffic jams and looking for a parking spot in the downtown. Parking plots are equipped with cameras, so it is also safe. Program was implemented in 2007.[23]

6. Paid parking plots in the city center.
This idea is developed is Tallinn to force people to use more public transport or bicycles instead of their private car. It is made on purpose to develop better quality of the air. Because of traffic jams and too many cars in the city the environment is polluted. It is also not convenient for tourists to park their car in the city centre, because it cost a lot of money. Because of that they are forced to use public transport or rent a bike.

EFFECTS

As it was expected registered population of Tallinn grew since April 2012 by 16 000 persons. Actions made in the city to provide better quality of public transportation made huge differences in statistics. Number of cars on main crossroads decreased 5-11%. The biggest fall is visible in the center of the city. Parking lots are available which can be used as new attractive public spaces. Number of passengers of public transport increased since 2013 and in local commuter trains increased 10 times. The number of people using bikes or walking is still growing.[24] For many citizens this way of transportation is their everyday habit to go to work and come back. For these who live more far away from the city centre Public Transportation System is providing more bus lines and local trains. It is the most important issue for the city council that everyone have easy access to fast, local transportation.

The most important action which has to be implemented in the nearest future is creating Sustainable Urban Mobility Plan, which is combining all of the programs of sustainable development together. Problems of mobility, city's metabolism, ecological solutions in architecture and participation revolution program will be combined together in this plan.

Tallinn wants to be low-carbon city. They are expecting producing 20% less CO2 until 2020.[25] To achieve that city needs to reduce traffic. If that happen Tallinn will create better life conditions for citizens. It is connected with better quality of the air, attractive public spaces and modern transport system. The city is promoting electrical vehicles and trying to familiarize Tallinn's citizens with new technological invention. This probably will be the future of transportation and it is a part of Sustainable Energy Action Plan 2011-2020. New technologies developed in roads construction are also providing new ways for designers. Materials used to build the road can have a huge impact on the climate change. Furthermore the city council wants to develop vehicle efficiency and emissions policy. All of these ambitious actions are planned to bring Tallinn closer to the award of Green Capital of 2018.

Fig. 10. Bicycles roads in Tallinn
Source: http://kaart.tallinn.ee/Tallinn/Show?REQUEST=Main&bbox-=524037.5,6578625.0,558512.5,6598575.0&layer=1060&lang=eng&WIDTH=1366&HEIGHT=623

[23] Green City Tallin

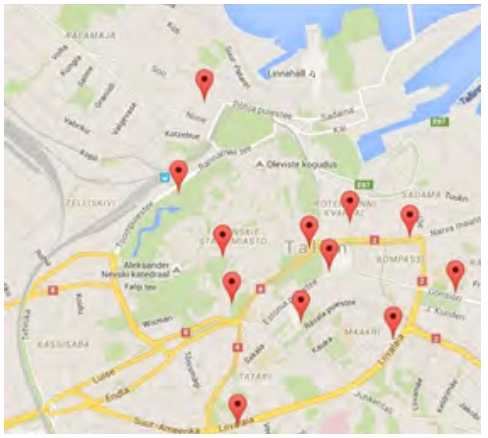


Fig. 11. Parking for bicycles in Tallin
Source: http://bikeep.com/

[24, 25] Sustainable Transport Perspectives for Estonia

1.4. TRICITY

Agglomeration called the Tricity consist of cities Gdańsk, Gdynia and Sopot. They are located on the Bay of Gdansk, partly on lowland coastal strip and partly on higher moraine hills. Location of Gdańsk is special because of its eastern part is situated on the depressed areas of the Vistula delta. Tricity has a fairly good road, rail, air and sea links with many European cities. This is the area of high landscape and natural value.

Fig. 12. Map with Tricity
Source: own elaboration

Tricity is a metropolitan area in Poland consisting of three cities in Pomerania: Gdańsk, Gdynia and Sopot, as well as minor towns nearby them. Urban structure of the area is a compact unit for urban development, which boundaries set only administrative divisions and urban fabric of the city is continuous. Tricity is located in northern Poland, in the Gulf of Gdansk and Puck Bay in Pomerania Voivodeship. The dominant role due to the size (nearly 63.5 % of the Tricity) and the number of inhabitants (approx. 62%) of the city is in the structure of the Tricity Gdańsk, which is also the seat of the Pomeranian government. Since 28 March 2007 Tricity, as an urban and coherent area, was formally recognized as an urban center under the Card of Tricity. The oldest references that relate to Gdansk (year 997), next one of the oldest cities from Triciti is Sopot (1283). Sopot is the smallest city form out of them. Third city which forms the region of Tricity is Gdynia and the first references concern a village called Gdina from 1253. However, as a city of Gdynia, it started its intensive development only in the twentieth century. Gdynia acquired city rights on March 4 1926. During World War II and the occupation by Nazi, population in Gdynia significantly changed the ethnic structure of inhabitants, because of the massive deportation of the Polish population from the city and populating it by German people. Gdynia again returned Poland in 1945 and in the same year began the development of the port city.

In the twenty-first century, the shape and directions of development of the Tricity will be determined mainly by the National Policy Municipal harmonized with the directions of the development of the European Union - the community to which belongs Poland. At the local level increasing influence on local politics in each city of the Tricity should have, established in the form of Association (2011), Metropolitan Area Gdańsk -Gdynia- Sopot, which main goal is to strengthen cooperation and to achieve harmonious development of the whole metropolitan area around Gdansk. The composition of the Association 2015 consists of all three cities or that co-creating Tricity: Gdańsk, Gdynia and Sopot.

One of the most important climate change impacts for region of Gdansk, Sopot and Gdynia are floods. There are two types of floods: sea flood (due to sea level rise and higher probability of 'so far' 100 years storm occurrence) and river flood (heavy precipitations, ice jams; higher danger when simultaneously occur with storm surge). Another impact is intensification of coastal erosion due to level rise and dangerous storms. Also there are risk of groundwater table level rising and ground

surface inundation; intrusion of saltwater into the fresh water aquifers; probability of landslides. To risks outlined above should be added anthropogenic factors, which increase the scale of the problem.

1.4.1. ENERGY POLICY AND QUALITY OF AIR

Data and documents connected with energy policy and quality of air has been mainly investigated in terms of reducing emissions and mitigate its adverse effects on humans health and life. Some of these activities were taken within the framework of plans and strategies developed for the region, metropolitan area or individual cities, and some tasks are independent of local governments and organizations. An introduction to the discussion on environmental policy in the Tricity is the general analysis of the energy situation in the Pomorskie region.

Strategic documents at local and regional detailing a series of short-term and long-term, which are designed to reduce emissions. Tricity being the largest agglomeration in the region, is also one of the most important areas in terms of strategic planning. It should be emphasized that the actions taken in the Tricity actions or prepared documents are mandatory - their creation is conditioned by the laws, regulations and EU directives.

Emissions measurement in 2011 has shown that the permissible concentration of greenhouse gases in the Tricity is not exceeded. Of great importance is the relatively high percentage of afforestation, which significantly reduces the carbon dioxide in the air. However, there was a significant excess of average daily concentration of PM10 dust and benzo (a) pyrene in most of measuring stations. The answer to this problem was the Air Protection Program Tricity Agglomeration proclaimed in 2013.
The scientific evidence is now overwhelming that global warming affects the temperature rise, which is a significant threat especially in cities where the discomfort is growing at a faster pace than in non-urban areas. The presence of the urban heat island (or rather heat islands within the agglomeration) causes intensification of the centripetal circulation of air at the surface of the earth, and thus the concentration of pollutants. That this phenomenon has an impact on the increase in the concentration of pollutants in the air. The most problematic areas are these with a high density of buildings and these situated along the busiest traffic arteries within the agglomeration.

As a result of measurements carried out in 2011, the highest concentrations of PM10 dust and benzo (a) pyrene in the Tricity occurred in February and March, that is, during the heating season. Some of the highest concentrations were also reported at the Gdańsk Głowny and Gdynia Śródmieście measuring stations (which are located in a city centers).It should be emphasized that these days prevailed very unfavorable weather conditions. In these days, there was the so-called. silence (wind force is less than 1 m / s). It affects the deposition of cold entrusts in the the ground layer of the atmosphere. Analyzing the occurrence of the highest concentrations in the year, it was found that in all measurement stations they occurred when the air temperature was low, which coincides with the heating season. The average value of the analyzed concentrations of the heating season is 10-35% higher than the average of the summer period.[26]

[26] Air Protection Program - Tricity Agglomeration

Region - also Tricity - has a big potential in terms of use of renewable energy sources. There are very favorable natural conditions. This area has a high potential of biomass (both production and waste) favorable wind conditions in the North and on Baltic Sea seashore area and the relatively favorable conditions for solar.[27] The Heat and Power plants in Gdansk and Gdynia have been co-firing biomass in already existing power boilers since 2008.

[27] The project of Spatial Development Plan for the metropolitan area of Gdańsk-Gdynia-Sopot 2030

As it was mentioned above during the research it has been discovered that a lot of strategical goals

has been mentioned in a number of plans and strategies. Another step is to define exact activities being the answer for environmental needs for Tricity and its inhabitants.

ACTIONS

Some of the actions that were taken in the Tricity are:

- actions taken to increase the traffic flow (eg. the introduction and improvement of the system Tristar),
- plans to create a cycling subsystem as part of the urban transport system - the biggest cycling system in Pomerania with Gdańsk as a leader of the project (2019),
- expanding pedestrian zones in the city center of Gdańsk,
- municipal grants for activities related to ecology, such as the installation of solar collectors or waste disposal of asbestos,
- advisory system in the field of energy efficiency and renewable energy sources for entrepreneurs;
- thermo-modernization of residential buildings in Sopocie- Project ENSURE,
- information campaign "Clean air in the Metropolis",
- development of the system of cycling routes.

A related issue is to improve the coherence of green areas, which are a very important element for the functioning of city organism, especially in the context of air pollution and quality of life:

- Action BAND - Plant a tree for Gdansk (it gives the possibility to provide space under the tree planting or to plant a tree on someone else's territory);
- planting trees on strategic areas of the cities (eg. around Disposal Plant in Gdansk). Complement for the specific actions being implement in space are educational campaigns. The activities in this area include: a series of educational and informative "Space City - For the people For the Environment", activities of Traffic Design, which aims inter alia to shut down one of the streets downtown Gdynia traffic.

EFFECTS

Statistics show that from 2011 to 2015 the level of average daily concentrations of PM10 dust fell in both the heating season like summer season. Nevertheless, in 2015 the value of pollution concentration was still remained above the acceptable average daily concentration of PM10 dust (which is 50 µg/m3). It appeared in all measuring stations [AMs] during the heating season and in four of them during summer season.[28]

[28] Air pollution in the agglomeration of Gdansk in Tczew reports in 2011, 2013 and 2015

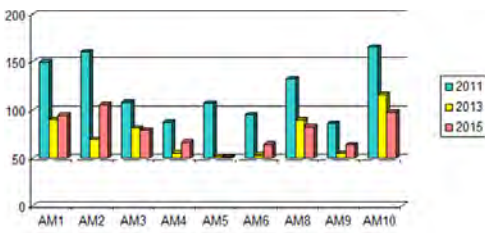


Fig. 13. Average daily concentrations of PM10 dust (µg/m3) in Tricity during the heating season
Source: own elaboration based on: http://airpomerania.pl/raporty/raporty-armaag.html

Analysis of changes taking place in the values of pollutant concentrations and the analysis of expert reports helped identify areas where air quality is worst. Changing climate and rising temperatures intensify the harmful effects of pollution on people's lives. Unfortunately, the exchange of air from the sea does not reach all areas of the Tricity to the same extent, and often that's where focus is heavy traffic.

1.4.2. WATER AS A SPECIAL CONTEXT TO COASTAL VIBRANT CITIES

Urban policy concerning the protection of water fronts is different in each of the cities. Gdynia and Sopot because of the lack of visible direct threats not determine current and further objectives in this range. However, in Gdansk planning it is primarily associated with flood protection.

ACTIONS

Measures taken in the Tricity for the adaptation to anticipated climate change come down primarily to the development of plans, strategies and projects. Maritime Office in Gdynia launched the renovation of quays.

1. Gdańsk
City of Gdańsk
- "Urban water strategy for Gdańsk",
- grant received in 2013 from Dutch program "Partners voor Water/Partners for Water/Partnerstwo dla wody",
- analysis actual situation of Gdańsk which pointed out unused water potential and threats coming from worked out flood infrastructure and climate changes,
- besides program gives propositions of exact operations, financing and way of self organization,
- "Revitalisation program for downgraded areas in Gdańsku" (LPR) - 2009,
- "Resolution of city council which sets down areas downgraded areas and designed to revitalization" - 2015.

Regionalny Zarząd Gospodarki Wodnej in Gdańsk (Regional Administration of Water Economy in Gdańsk)
- "Program of complex flood protection of Żuławy region - till year 2030",
- includes City of Gdańsk situated within reach of Wisła and Motława rivers,
- from program's financial resources renovation and modernization of infrastructure is lead (consideration climate changes).

Maritime Authority in Gdynia
- European Funds: Operative Program for Infrastructure and Environment 2007-2013 i 2014-2020,
- from program's financial resources renovation and modernization of infrastructure harbor is lead.

Regional Operative Program for Pomeranian Voivodeship for years 2014-2020
- program concerns protection of environment; protection from natural disasters including climate changes; program is financing proposed projects; program does not have it's own operations.

2. Gdynia
Maritime Authority in Gdynia
- European Funds: Operative Program for Infrastructure and Environment 2007-2013 i 2014-2020,
- from program's financial resources renovation and modernization of infrastructure harbor is lead.

Regional Operative Program for Pomeranian Voivodeship for years 2014-2020
- program concerns protection of environment; protection from natural disasters including climate changes; program is financing proposed projects; program does not have it's own operations.

3. Sopot
Regional Operative Program for Pomeranian Voivodeship for years 2014-2020
- program concerns protection of environment; protection from natural disasters including climate changes; program is financing proposed projects; program does not have it's own operations.

EFFECTS

Due to the minimal range of activities not yet achieved significant results; the only effect is the construction of quays and wharfs of Granary Island and of the Dead Vistula River in the area of Płonia.

According to prepared projects is expected to improve the technical condition and modernization of the existing wharves and infrastructure of the drainage of the consideration of their adaptation to raise the water level.

1.4.3. SUSTAINABLE URBAN MOBILITY (SUM)

The dynamic development of cities and the growing level of motorization led to a situation in which cities are forced to verify its policy of mobility and spatial planning. With these areas is closely linked to the ability of residents of the city to move. It also affects the level of emissions and a significant increase in the environment affecting the land for the transport. These elements are the genesis of the search for new solutions, which are not easy as they are concerned with area of communication habits created and preserved by generations of residents. Therefore, to ensure that not only for the present but also for the future generations the appropriate and expected level of quality of life is developed, it is essential to achieve a balanced state of urban mobility and the proper management of the mobility that maintain its sustainability regardless of the circumstances. This task should be based on well- recognized conditions and habits of communication so that through the development and adoption of appropriate mobility policy and representative indicators showing the current state, the target and the output can be determined whether it is properly implemented urban policy in the field of sustainable mobility. Finally, as the main objective of sustainable mobility policy should be considered a transformation of urban structures of the city, together with their offer to minimize the necessity of the journey, with particular emphasis on the movement of private cars and as a result to increase attractiveness of public transport in cities supplemented on acceptable respectively shorter distances by cycling and walking.

Currently, the biggest problem of the Tricity is the lack of a common, coherent and consistent Sustainable Urban Mobility Plan (SUMP) in the full range (public transport, spatial planning, cycling transport and walking, parking policy).

ACTIONS

Some of the actions that were taken in the Tricity in terms of Sustainable Urban Mobility are:

- equitable distribution of functional space of the roadway (street) in relation to the efficiency of transport , which does not affect the lowering of the quality of life in the city,
- decarbonisation of transport and its negative impact on the demand for resources and to reduce the negative consequences of social, economic and environmental impacts of the availability of individual transport,
- improvement of the air quality in the city by increasing green space and reducing the space purposed the communication service and car transport,
- improving accessibility and attractiveness of public transport,
- decarbonisation and energy demand from unrenewable sources, through the implementation of new technologies based on renewable sources of power, eg. electro-mobility,
- change of modal split that shows residents' communication habits by increasing cycling, walking and public urban transport. Modal Split is one of the indicators of progress in the implementation of the city and promoting sustainable forms of transport. It shows what percentage of the journey is performed by using various modes of transport (e.g. bus, car, bike).

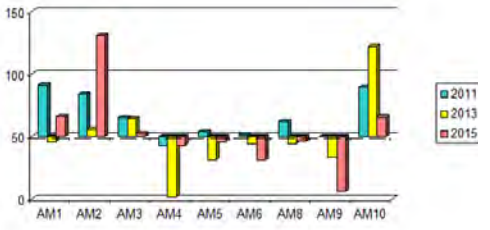
Additional actions for sustainable urban mobility plans by Gdynia are:

- promoting public transport, cycling and walking,
- testing and developing of eco vehicles,
- involvement of the citizens in the process of mobility planning (participatory model),

- use of the society tools to communicate with citizens and provide information in real time.

EFFECTS

Currently, among the cities that build up Tricity, the most advanced in the activities for the implementation and proper management of sustainable urban mobility is Gdynia. Actions that are taken to improve the mobility based on the principles of sustainable development in Gdynia have to meet additional goal that can be implemented in other cities including Sopot and Gdansk. Currently, a lot of efforts are made to diagnose the condition and needs in order to change the existing communication habits of the Tricity residents. The initiatives in the field of sustainable urban mobility in which it participates Gdynia can be read at: www.mobilnagdynia.pl. Tricity communication habits of residents of the example shown in the background of Gdansk Copenhagen, Gothenburg and Tallinn. This habits, illustrating the level of sustainable urban mobility citizens of Copenhagen, Gothenburg, Tallinn and Gdansk – see charts below.



14. Average daily concentrations of PM10 dust (µg/m3) in Tricity during summer season
Source: own elaboration based on: http://airpomerania.pl/raporty/raporty-armaag.html

One of the main threats to effectively adapt the city to the effects of climate change is the lack of urban policy in achieving the fundamental objectives of which are:

- creating high-quality solutions in the field of spatial planning limiting the need to use private car for daily errands,
- creating useful public transport stops as a high quality elements of public spaces,
- the implementation of effective and comprehensive programs to improve safety and accessibility of public spaces for children and elderly or disabled people,
- promoting the application of the principles of universal design to create shared spaces and wakability zone,
- design in the urban space of flowing water combined with urban greenery and street furniture, allowing rest.

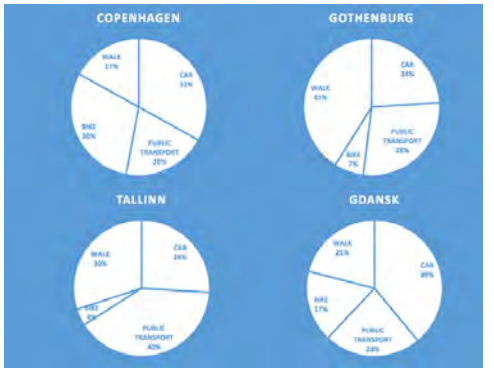


Fig. 15. Modal Split of Copenhagen, Gothenburg, Tallinn and Gdansk
Source: www.designforall.pl, compiled on the basis of: www.epomm.eu/

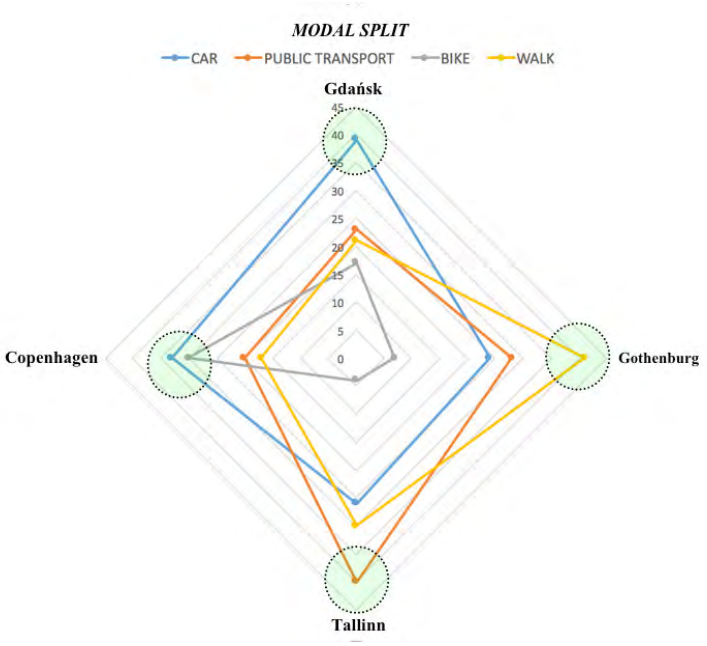


Fig. 16. Communication habits of the residents of Copenhagen, Gothenburg, Tallinn and Gdansk based on modal split
Source: www.designforall.pl, compiled on the basis of: www.epomm.eu/

BALTIC SEA CLIMATE FEVER
CREATIVE SOLUTIONS FOR WATERFRONT CITIES

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1. NATURAL AND ANTHROPOGENIC THREATS TO THE TRICITY, RELATED TO CLIMATE CHANGE

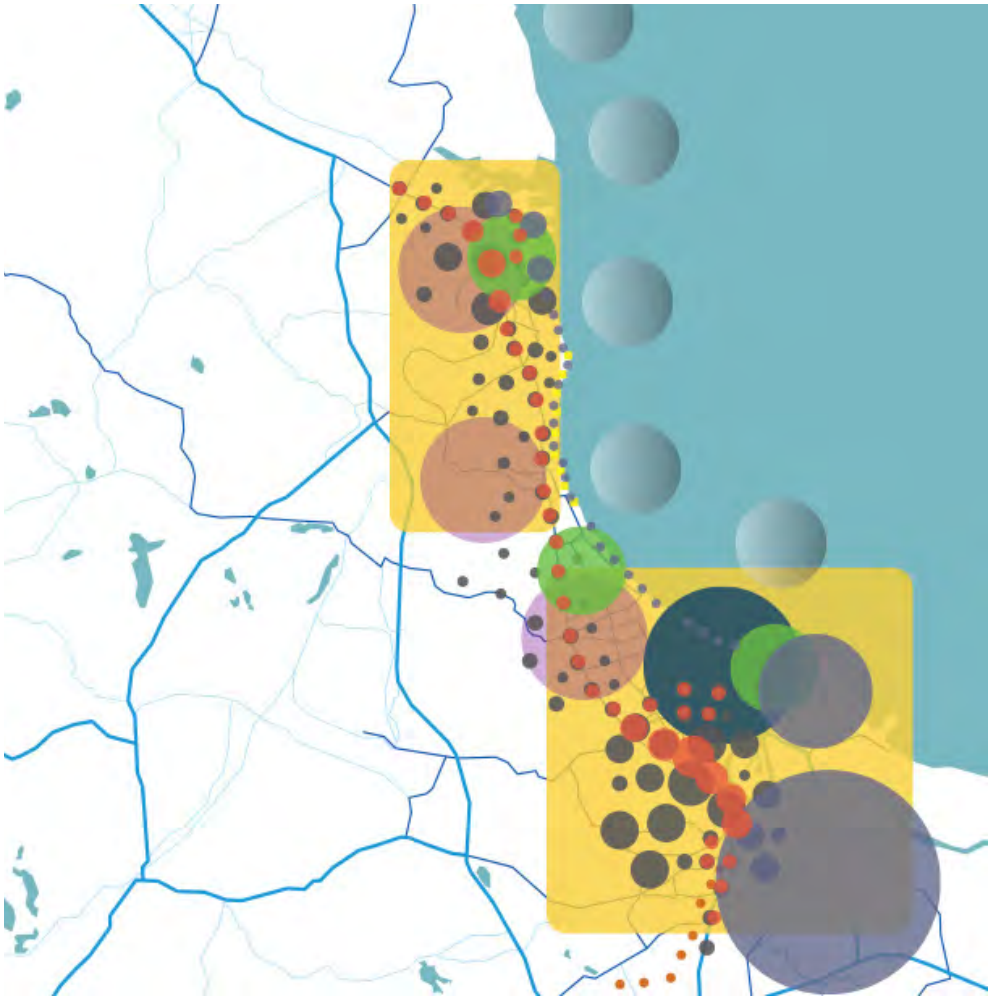
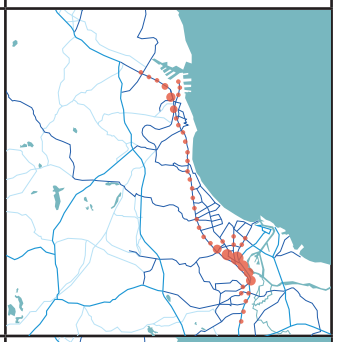
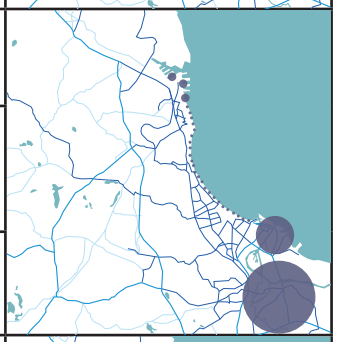
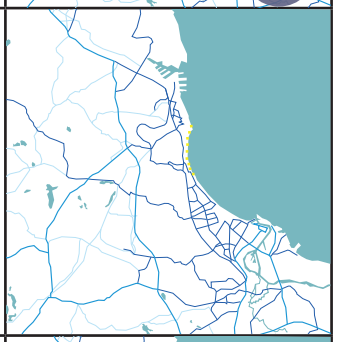
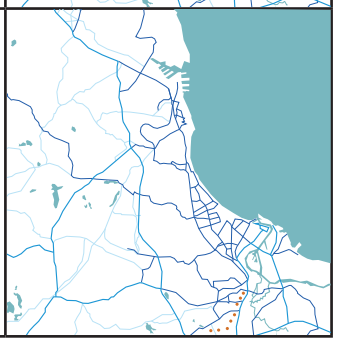
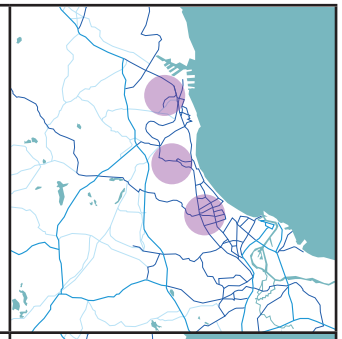
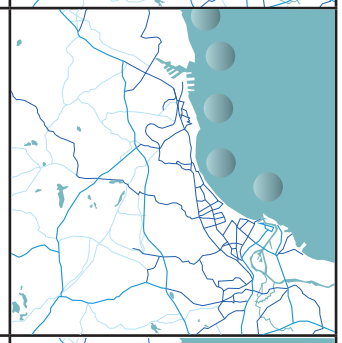
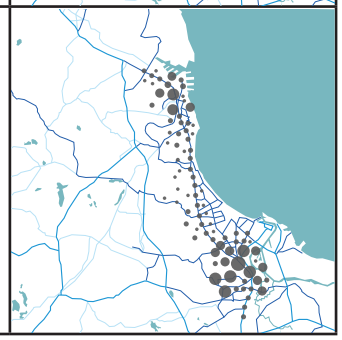
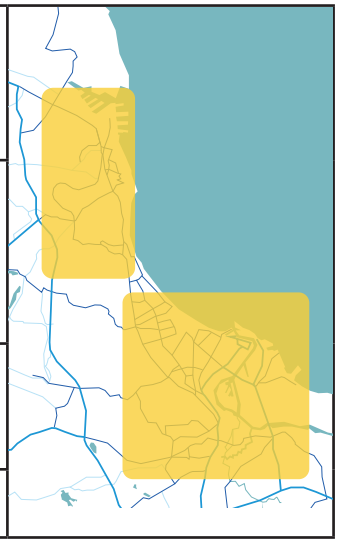


Fig. 17. Threats in Tricity
Source: own elaboration

THREATS CONNECTED WITH CLIMATE CHANGES IN TRICITY	AREA OF APPEARANCE IN TRICITY	MAP
space shaped for the preferences of car traffic	the main traffic arteries within the Tricity: Zwycięstwa Avenue, Niepodległości Avenue, Grunwaldzka Avenue, Main City of Gdańsk, Wrzeszcz	
river floods caused by heavy precipitation, ice blockage in the mouth and storm surges	mainly in Gdańsk - areas situated from the sea level till about 1 m above	
rise of the sea level till about 1m (during storm possible additional rise about 0,2m more)Sea Floods	along the coast in the whole Tricity	
floods caused by heavy precipitation	mainly in Gdańsk - areas situated from the sea level till about 1 m above	
coastal erosion (including landslides cliffs)	along the coast in the whole Tricity; Gdynia-Orłowo cliff coast	
landslides slopes caused by strong downpours	Gdańsk - the edge of the upper terrace	

raising the underground water level, waterboarding buildings	Tricity - areas situated from the sea level till about 1 m above	
risk of deterioration in the quality of drinking water (salinity of groundwater and drinking water intakes)	Tricity - areas situated from the sea level till about 1 m above	
eutrophication - blooming of alga	Gulf of Gdańsk	
exceedances of permissible limits of concentration of contaminants (In Tricity are: particulate matter PM10 dust and benzo(a)pyrene)	Tricity- areas where is low exchange of air from the sea, the most crowded transport nodes	

significant prevalence of conventional energy sources over renewable energy sources in energetic structure of the city	Tricity	
growing discomfort of living in the city - lack of spatial coherence between green areas, weak connection city-water, the phenomenon of urban heat island	Tricity	
unsophisticated methods of environmental education - the lack of awareness of the threats	Tricity	
strong winds, hurricanes, twisters	Tricity	

18. Maps with signle threats in Tricity
Source: own elaboration

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1. SUMMARY

Catalogue of solutions which Gothenburg, Copenhagen and Tallinn applied in order to adapt to the consequences of the expected climate changes. Proposals of creative use of observed methods and solutions in the Tricity.

THREAT	CITY	SELECTED MODEL ACTIONS	PROPOSALS FOR THE APPLICATION TRICITY
Space shaped for the preferences of car traffic	Gothenburg	construction of rental bikes at transport hubs	construction of bike rental at the major stations of Rapid Urban Rail (SKM) and city centers
		the "Electricity" program - promoting hybrid and electric vehicles; the program joined private sector and public sector (companies, offices, universities, science and technology parks)	continuation of the process of introducing hybrid or electric vehicle in public transportation. Promotion and financing of ecological transport. Further development of the tram and trolleybus
	Copenhagen	densification of public transport network so that almost 80% of the population has access to frequently shuttle service (from 3 to 10 minutes) within a radius of 300-400 meters from the place of residence	Increasing the frequency of running public transport in the mst inhabited districts where occurs the lack of efficient communication connections

		development and modernization of cycling infrastructure - system PLUSnet: - increase of the number of lanes and roads, - separation of streets for bikes, - subordination of traffic to bikes, - reducing the speed limit for cars, - Green Routes, Cycle Highways and cycle footbridges - eg. Cycle Serpent, - Intelligent Traffic System (ITS) - signaling in the surface, - parkings for bikes-parkings adapted for the cargo bikes, - park&ride and bike&ride parkings, - applications for cyclists - "I Bike CPH" - facilitating to select the most comfortable routes in the city	- creating a system of bike&ride at the most frequented stations of Rapid Urban Rail (SKM) eg. Gdynia Wzgórze Św. Maksymiliana, Gdańsk Oliwa, Gdańsk Wrzeszcz, Gdańsku Główny, - construction of footbridges for pedestrians and cyclists over the ring road, which would merge residential districts with rest of the city (eg Osowa)
		integration of public transport – online travel planners, one ticket for all means of transport	simplification of the rules of use and access to the metropolitan ticket, which in its current form is not working properly
		construction of underground parkings and contract with the shopping centers on the use of car parks outside opening hours	construction of underground parkings on the occasion of realization New Downtown in Gdyni and Young City in Gdańsk Use of shopping centers' car parks located in Gdansk Wrzeszcz outside opening hours

	Tallinn	reduction of car traffic by expanding Park&Ride system and paid parking zones in the city centre	construction of Park&Ride system at the most frequented railway stations - mainly Pomeranian Metropolitan Railway (PKM)
		free public transport for residents	reduction in ticket prices for public transport
river floods caused by heavy precipitation, ice blockage in the mouth and storm surges (threat to buildings, infrastructure etc.)	Copenhagen	the use of reverse valves in drain outlets to prevent backflow of water while raising Skt. Kjelds District (Klimakvarter)	modernisation of the flood gates system on storm water drainage in Gdansk
- rise of the sea level till about 1m (during storm possible additional rise about 0,2m more), - sea floods, - floods caused by heavy precipitation	Gothenburg	intensive research on new strategies for the prevention of floods, such as barriers along and across the river	drafting of the water barrier protecting the mouth of the Vistula River against water retreating from the sea up the river
	Copenhagen	- "Cloudburst Projects" - investments that are designed to absorb rainwater, - the projects cover 7 areas, which are to form a surface anti flood system for the city, - use of green infrastructure - including so-called "green roofs" to retain rainwater - limiting the amount of water getting into storm water drainage	- preparation of the draft Green Zones located throughout the city. - use of green infrastructure especially on the border of the upper terrace of Gdansk and Gdynia (from which the water rapidly flow down to the lower terrace). - exploiting the potential of Tricity which is a large number of flat roofs (mainly block buildings) in order to adapt them to the green roofs. Promoting ecological building in a business society

		- ongoing project the so-called "Climate-Resilient Neighbourhood" in Østerbro district, which is to help reduce flooding the streets during floods caused by heavy precipitation	the use of these solutions for Tricity eg. for Lower Wrzeszcz
		Skate Park in Roskilde- simultaneously fulfilling the functions of the reservoir	the use of this solution in Tricity for example near the mouth of the Motława
growing discomfort of living in the city - lack of spatial coherence between green areas, weak connection city-water, the phenomenon of urban heat island	Gothenburg	promotion of urban farming	supporting the maintenance of the existing allotment gardens
	Copenhagen	creating an unified system of green neighborhoods, which aims to reduce the temperature and increase shading. Use of places of natural accumulation of rainwater to create so-called Rain Gardens, which provide shade and contribute to decrease of temperature	- creation of system of connections between green areas in whole Tricity, not only in individual cities, - identification of places with the highest discomfort in summer (high temperature, lack of shade etc.)
		efforts to reduce car traffic by increasing the number of public transport users and cyclists (look threats: "Space shaped for the preferences of car traffic")	look threats: "Space shaped for the preferences of car traffic"
		opening the city water through the use of comprehensive urban solutions (eg. construction of new canals and residential quarters with direct access to the water)	organizing the public areas at waterfronts especially in Gdansk, where these areas are unused and often inaccessible

	Tallinn	opening the city water through the use of comprehensive urban solutions	organizing the public areas at waterfronts especially in Gdansk, where these areas are unused and often inaccessible
		gradual development of city plans and reclaim of abandoned areas obtained as a result of political changes in different parts of the city taking into account the diversity of use	taking into account the different water/ coastal zones users (tourists, sailors, passenger ships, trade, etc.) Preventing the formation of enclaves
risk of deterioration in the quality of drinking water (salinity of groundwater and drinking water intakes)	Gothenburg	Lackarebäck - the biggest Scandinavian ultra filter for water treatment and water purification that is independent microbial barrier	Creation of an alternative way of obtaining drinking water in case of loss of operating water intakes located in the a seaside lane by investing in innovative systems of rainwater treatment in the framework of activities related to environmental protection (eg. introduction may be organizing an international forum for the exchange of experiences in the field of water treatment technology)
	Tallinn	purification and collection of rainwater as a natural resource	
raising the underground water level, waterboarding buildings	Gothenburg	project of building the test area SUDS (Sustainable Urban Drainage System)	investing in innovative urban drainage systems
significant prevalence of conventional energy sources over renewable energy sources in energetic structure of the city	Gothenburg	GoBiGas (Gothenburg Biomass Gasification Project) - production of biogas from waste	increasing the use of waste for energy acquisition (increasing the production of biogas in Z.U. Szadółki and Eko Dolina Koleczkowo)

		CELSIUS Project- use of heat from the municipal network in home appliances such as a washing machine, hair dryer, instead of heating the cold water or air using electricity. The use of heat from the municipal network is also provided for ferries while they are moored in port	checking the the possibility of introducing the project Celsius in the Tricity
	Copenhagen	Concerto Valby Project - wide implementation of photovoltaic panels in the district of Valby - a number of investments that draw energy from sunlight	undertaking strategic actions in order to use photovoltaic panels to generate energy in Tricity
unsophisticated methods of environmental education - the lack of awareness of the threats	Gothenburg	education in the field of climate change and the environment protection for all city officials	gradual implementation of educational panels about adaptation to climate change in all departments of city council - not only in departments of environment
	Copenhagen	city indicator created to rise public awareness in terms of environment protection: discharging steam from the chimney in the form of a ring, every time when another ton of CO2 is generated	attempt to create three different urban indicators (Gdynia, Sopot, Gdańsk) informing about the state of the environment, which would be a "green icon" of each of the cities

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PART ONE

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Baltic Sea Cities threats:

- too large amount of CO2 emissions
- **floods caused by the overflow of rivers**
- **sea-level rise causes sea floods**
- **ground-water rise causes flooding buildings**
- risk of deterioration of drinking water quality
- phenomenon of urban heat island
- growing discomfort of living in the city, by:
  - lack of spatial coherence between green areas
  - poor connection-city water
- exceeding of pollution
- **insufficient use of the energy potential of rene**
- wable energy sources
- **insufficient environmental education**

Refernce cities	Selected model actions	Proposals for application for Tricity
Estonia, Tallin	free public transport for residents opening the city to the water through the comprehensive urban planning **reducing car traffic through park&ride system** and paid parking zones in the city center	reduction of ticket prices for public transport organizing the public areas at waterfronts especially in Gdansk, where these areas are unused construction of Park&Ride system at the most frequented railway stations like PKM
Sweden, Gothenburg	program "Electricity" - promotion of hybrid and electric vehicles new strategies for the prevention of floods **Lackarebäck - ultrafilter treatment and purification of water**	introducing hybrid or electric vehicle in public transpo-rtation promotion and financing of ecological transport finding a new way for obtaining the drinking water continuation of the process of introducing hybrid or electric vehicle transportation.
Denmark, Copnehagen	the use of reverse valves in drain outlets to prevent backflow of water while raising unified system of green neighborhoods, which aims to reduce the temp. and increase shading "Cloudburst Projects" - - investments that are designed to absorb rainwater	modernisation of the flood gates system on storm water drainage in Gdansk creating of system of connection between the green areas in the whole Tricity,not only in individual cities preparation of the draft Green Zones located throughout the city

19. Baltic Sea Cities threats
Source: own elaboration

Fig. 20. Free public transport, Tricity
Source: own elaboration

Fig. 21. Skatepark in Regans Park, Gdańsk
Source: own elaboration

Fig. 22. Vertical garden on the Wyspa Spichrzów, Gdańsk
Source: own elaboration

CITIES RISING FROM THE ASHES

War. Fear. Insecurity. Destruction. Hopelessness. Combatant and civilian casualties. Damage of cultural heritage. But after all crumb of hope making the cities start rising from the ashes.

The image of european cities after World War II was catastrophic. They were struggling with war destructions for years. Part of them are still looking for a solution to fight off all of consequences of the war. Today, after 70 years, those destructed cities are vibrant places, and above all, safe settlements. Their experiences of the rebuilding process might be useful for those who are not in such a comfort and safe situation today. Around the world there are many conflict zones and cities located there which are turning to dust.

The main aim of that research is to analyse Hanseatic cities destructed during the World War II and their rebuilding process, and basing on that to evolve recommendations for the rebuilding process. Due to the current situation in the Middle East, especially cities located there were taken into consideration. Stories of rebuilding Hamburg, Szczecin, Gdańsk and Kaliningrad might give them hope for better future, because it is possible for cities to rise from the ashes.

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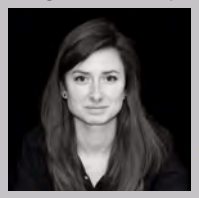

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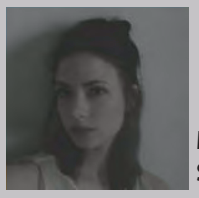

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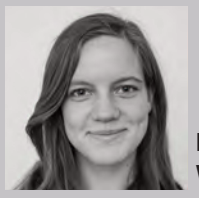

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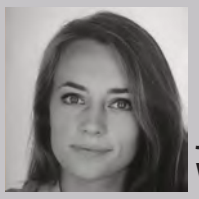

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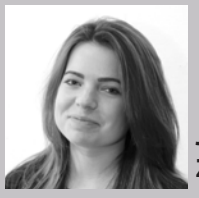

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CITIES RISING FROM THE ASHES

THE IDENTITY OF BALTIC REGION CITIES DESTROYED DURING II WORLD WAR IN CONTEXT OF PROCESS OF REBUILD, ARCHITECTURE AND URBAN DESIGN, GUIDELINES FOR MIDDLE EAST CITIES WOUNDED DURING THE WAR

Othman Al-Mashhadani (Mentor)
Marta Rusin (PhD Student)

1. INTRODUCTION

Europe is a safe place now, but today's security has not look like this ever since. After World War II a lot of European cities were completely destroyed. Among of them there were also Baltic Region Cities – members of historical Hanzeatic League. This study will emphasis on four cities, Kaliningrad - Russia, Hamburg - Germany and Szczecin and Gdańsk at Poland.

Today, after 70 years since the end of WW II, those cities are vibrant places and, above all, safe settlements. However, around the world there are still cities, which are located in the conflict zones. Basing on our experience, we would like to meet halfway with **Middle East** cities that are located in conflict zones. Their conflict will end eventually and the rebuild process will be need to begin. Due to that, we would like to share our knowledge with people who will be responsible for future rising up Middle East cities from ashes.

1.1. RESEARCH PROBLEM

World War II had destructive impact on cultural heritage. In 40's and 50's part of authorities of destroyed cities decided to rebuild pre-war monuments and urban structure. Basing on those decisions experts prepared plans for the rebuilding process. In 1954 during conference in Hague, United Nations established **Convention for the Protection of Cultural Property in the event of Armed Conflict** to secure cultural heritage including architecture during future wars. In that document UN predicated:

> 'Being convinced that damage to cultural property ***belonging to any people whatsoever means damage to the cultural heritage of all mankind,*** since each people makes its contribution to the culture of the world: Considering that the preservation of the cultural heritage is of great importance for all peoples of the world and that it is important that this heritage should receive international protection;' (Szmygin, 2015).

Whereas Hague Convention applies only to its signatories, it pays great attention to the protection of the cultural heritage in the time of war and should be considered by other nations as the experience of countries which came through the war.

A **complementary adjunct** to Hague Convention and other similar documents might be research papers describing the rebuilding processes in the cities affected by the war. Moreover there is a current need to prepare that kind of study for the Middle East cities which are suffering the war today.

1.2. METHODOLOGY

Our approach based on research of the post-war rebuild processes. The cities, which we have chosen to research, had to meet requirements such as:

- location in Baltic Sea Region,
- historic affiliation with Hanzeatic League,
- being destructed during II World War.

Finally we have chosen four cities which presented different approaches in the rebuilding process. Those cities: **Kaliningrad, Hamburg, Szczecin and Gdańsk.**

In the second part of our work we conducted the research to get familiarize with history of the rebuilding processes in each of those cities. We based the research on various **publications** written in Polish, English and German, we got in touch with **experts** familiarized with that subject: prof. Jakub Szczepański (Gdańsk University of Technology, Poland), prof. Piotr Fiuk (West-Pomeranian University of Technology, Poland) and **local representatives:** Anna Voitenko (Kaliningrad). Each city was studied by two-, three-person teams.

In the third part, we gathered our observations and by basing on them, we have prepared **recommendations** for the cities from the Middle East, which are facing the problem of rebuilding the city when the conflict ends. We confronted recommendations with the current situation in the Middle East. Our goal was to create a handy set of guidelines which might be applicable in the Middle East cities after the end of military conflicts.

1.3. OUTCOME

The outcome of our research are brief articles consisting of text, timeline and photos comparing the **pre-war and post-war image of the city**. The essence of gathered information and group's observations are combined and submitted in recommendations which are dedicated to authorities of the Middle East cities.

1.4. SUMMARY

Sharing the knowledge is a duty of scientists and academics. We should realize that our knowledge could help people in other part of the world. Thanks to that, we can also teach from each other. Europe came through the war and can share that experience with the Middle East cities, located in conflict zones - **the experience of rising from the ashes.**

2. CURRENT SITUATION OF THE MIDDLE EAST CITIES

The location of **The Middle East region** is centered between **Africa and Asia.** The Middle East borders the European continent from its southeast by Cyprus, Turkey, and borders Africa from the Northeast by Egypt across the Mediterranean Sea. Arabs, Kurds, Persians, and Turks found the main **ethnic groups** in the region by population, while there are some smaller ethnic and ethno-religious groups form vital minorities such as Armenians, Assyrians, Copts, Druze, Jews, …etc. (Shoup, 2011).

Environmentally, the Middle East in general has a **harsh climate,** which is hot and arid. Therefore, due to its unique environment, fresh water is limited, only to some areas of the region. Water as in irrigation is used in lands for agriculture and to support the citizens with their daily biological needs, which is provided by several major rivers, such as the Nile in Egypt's north delta, the Tigris

and Euphrates river banks of Mesopotamia (Syria & Iraq), which is well known as the Fertile Crescent (Zereini, 2008).

Historically, the Middle East dates back to **the beginning of human civilizations.** The Middle East has a unique geopolitical position among other regions, which can be easily recognized. Many major religions in the world had started within its land, such as Judaism, Christianity, and Islam (Peters, 2004).

The Middle East has many well known cities for its rich history, such as Urshalim, Makah, Baghdad, Cairo, Damascus, Aleppo, and Beirut etc. Unfortunately, since 1947, the region did not find time to heal from its past wounds, especially: Urshalim, Baghdad, Damascus and Aleppo. The **ongoing conflict** and the unstable political environment of some countries of the Middle East **affects human life and civilization.** During the years, many conflicts and civil wars have appeared between countries acquired for power and control reasons that give to some radicals of The Islamic State of Iraq and Syria or shortly called ***ISIS*** between 2013-2016 to committee many crimes on humanity within Syria, Iraq and oversea in Europe.

Cities of the Middle East have lost many of their own **traditional fabric,** historical areas, sites, and unique era buildings because of that conflict. Among all we can listed cities such as: Beirut in Lebanon, Urshalim in Palestine, Baghdad and Nineveh in Iraq, and Damascus and Aleppo in Syria. These crimes are committed on all humanity because of the loss of such kind of rich legacy that has importance among the other world civilizations it is a legacy not only for middle-eastern people, but also for all humanity.

As urban planners and architects, we need to find techniques that might be used as guidelines to help rebuild these cities in **respect their rich history** and **provide their societies to flourish once more.**

3. KALININGRAD
THE CITY WHICH TRIED TO FORGET

Othman Al-Mashhadani
Marta Rusin
Marta Pawlaczyk, Krystyna Warsińska

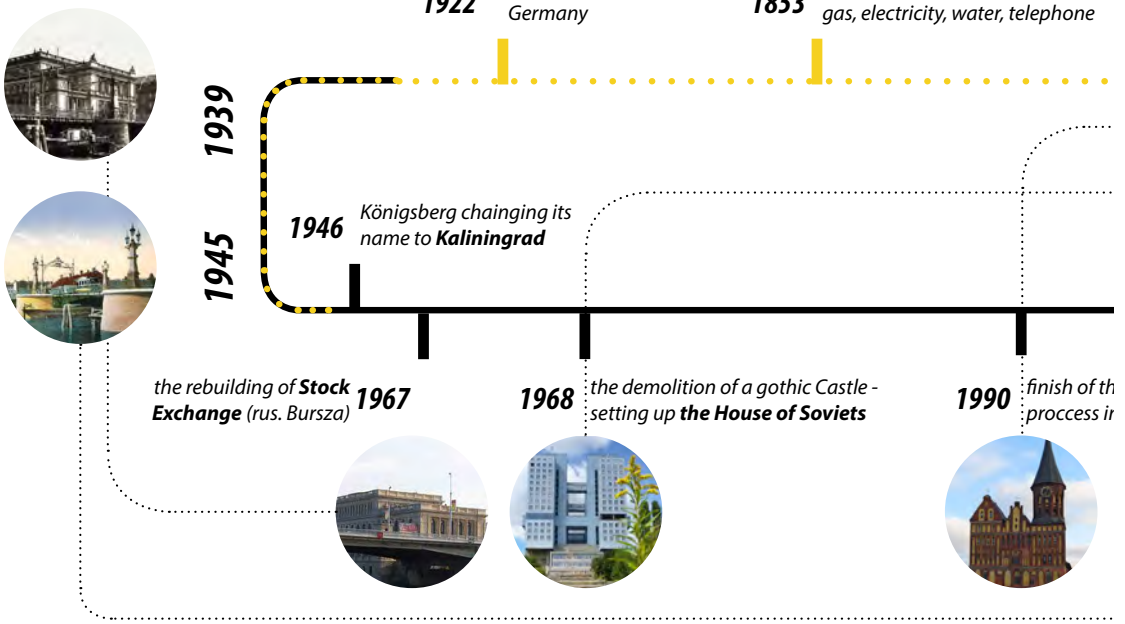
PREFACE

The most important matter in this article is to juxtapose different approach into the rebuild processes in cities, which has shared a similar history. The main actors in these researches are the official representatives of the states, often called by the nation's name (Russians, Soviets). These representatives include executive power such as presidents, ministers and other officials. Otherwise, the citizens' opinion is shown in interviews and web pages. Authors' intention was not to indicate the proper or improper way of arising cities. More interesting conclusions are sociological aspects between present-day inhabitants with their surroundings.

THE HISTORY OF CITY KÖNIGSBERG AND KALININGRAD

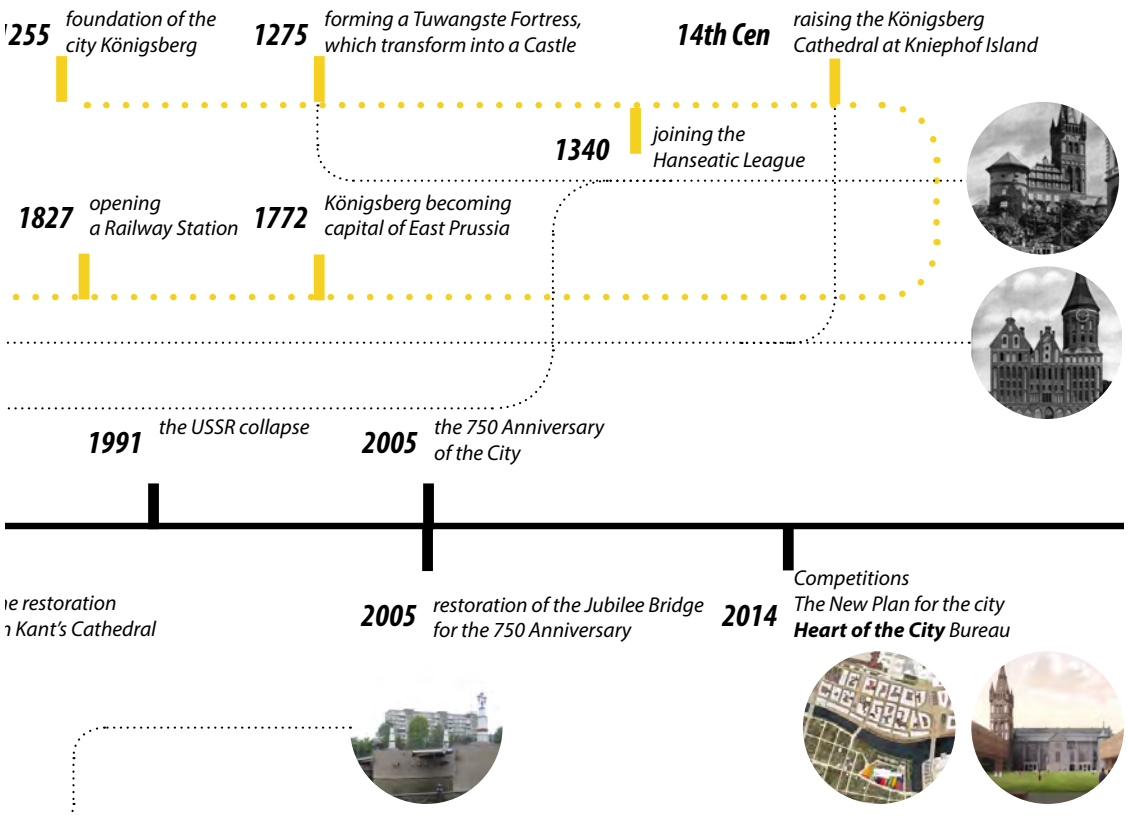
Königsberg was **founded** by the Teutonic Knights in **1255** on the site of Prussian stronghold Tuwangsteln. In **1340** the city joined **the Hanseatic League** and developed into an important port for the south-eastern Baltic region (Szczepański, 2008).

Königsberg became **the capital** city of East Prussia in **1772** (Karpenko, Krasnov, Simons 2014). The 1600's till 1800's were dominated by the renaissance and baroque styles in buildings, mostly along the railway (Salachov, Sarnits 2006). In 19th Century Königsberg was developing very fast. Until World War II, city reached its peak of prosperity, having accomplished the first airport in Germany (Salachov, Sarnits 2006).



1. View of the Island

2. Königsberg before 1945



3. Kaliningrad today

4. Map of Kaliningrad

1. Stock Exchange
2. Kant Island - Kneiphof
3. The Castle
4. Old Town
5. Cathedral
6. House of Soviets
7. Fishing Island
8. Löbenicht

The year 1944 was for Königsberg the beginning of the end. 360 aircraft from the Royal Air Force bombed the city into the ground (Beyern, 2014). Main historic parts were changed into ruins. During the Potsdam Conference in **1945 East Prussia was liquidated** and the city called Königsberg was wiped from the map of Europe (Beyern 2014; Karpenko Krasnov, Simons 2014; Hartwich 2015).

Königsberg was renamed Kaliningrad in 1946. The new name did not refer to "King" (König) anymore and as the renaming happened just after the death of Mikhail Kalinin, Chairman of the Presidium of the Supreme Soviet of the Union of Soviet Socialist Republics (USSR), one of the original Bolsheviks, the city became "Kaliningrad".

Officially Kaliningrad was annexed by the Soviet Union as compensation and reward for German aggression against the USSR. Stalin (the leader of the Soviet Union between 1920 and 1953) claimed that this area was originally slavic. Nevertheless, the most important reason for **incorporating Kaliningrad into the USSR** was its geographical aspect of being the farthest eastern port on the Baltic Sea which is "ice free" all year round (Browning, Joenniemi 2003).

Kaliningrad Oblast was separated from the rest of Russia when the Baltic states and Belarus gained independence in **1991**, though it has an open connection to the rest of Russia across the Baltic Sea. Moreover, Kaliningrad has become the westernmost region of the Russian Federation. As it happens, it is situated at equal distances from the Russian capital and Brussels, the headquarters of NATO and the European Union (EU). It is the strategic location which made Kaliningrad a military-strategic region (it had been since 1945)(Oldberg 2001).

GOTHIC CASTLE AND THE HOUSE OF SOVIETS

The Konigsberg Castle site was originally an Old Prussian fort called Tuwangste, which was constructed in 1275. Throughout all centuries building was gaining historical strata. During World War II, the castle was bombed, though a part of the thick walls was still left standing (Jasiński 1994).

In 1968, on the orders of Leonid Brezniel, a leader of the Soviet party, the gothic castle was destroyed. The demolition of its remains was justified as being called a "hornet's nest of militarism and fascism". In the same location it was decided that a new building was to be built, a landmark resembling Soviet importance and power - the House of Soviets, an enormous modernist dome, covered with white plaster. At the end of the building process, it was observed that the foundations had started to subside. The building was never completed, and never occupied. Demolition of this object was too expensive to come to realisation, so the building still stands today. (Szczepański 2008; Browning, Joenniemi 2003; Verlaan 2013). The House of Soviets is the only landmark and we can't deny that it has a shocking story beneath it. It still evokes emotions among citizens and they call it the Monster. The danger of collapse has created a barrier that no one wants to cross. However, it was recently painted a pastel blue colour for a more friendly look (Wood 2014). We can conclude that this is a building of special interest to citizens. Or authorities' helplessness. In 2009 it attracted the attention of artists, who used it for a project highlighting a problem of a lack of public spaces in Kaliningrad (Cwietajewa 2013).

Most public spaces from pre-war times have disappeared like the buildings between which they existed. In new historical part of the city it is not easy to find user-friendly public spaces.

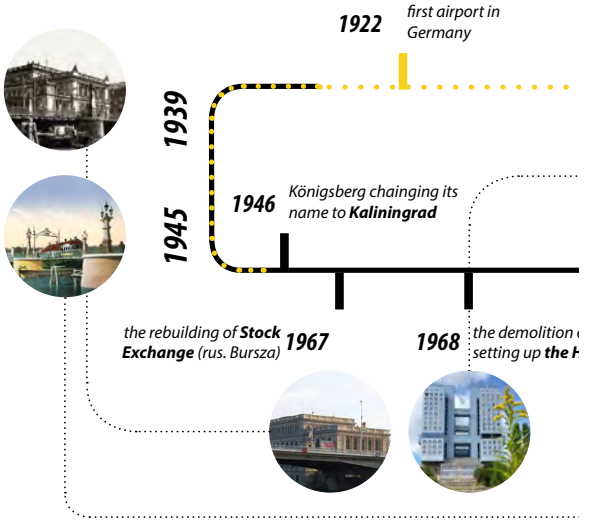
5. View of the Castle before II world war

6. View of the Castle today

7. The Castle in Middle Ages

8. The Castle after II World War

9. The House of Soviets



10. The Cathedral before II World War

11. The Cathedral nowadays

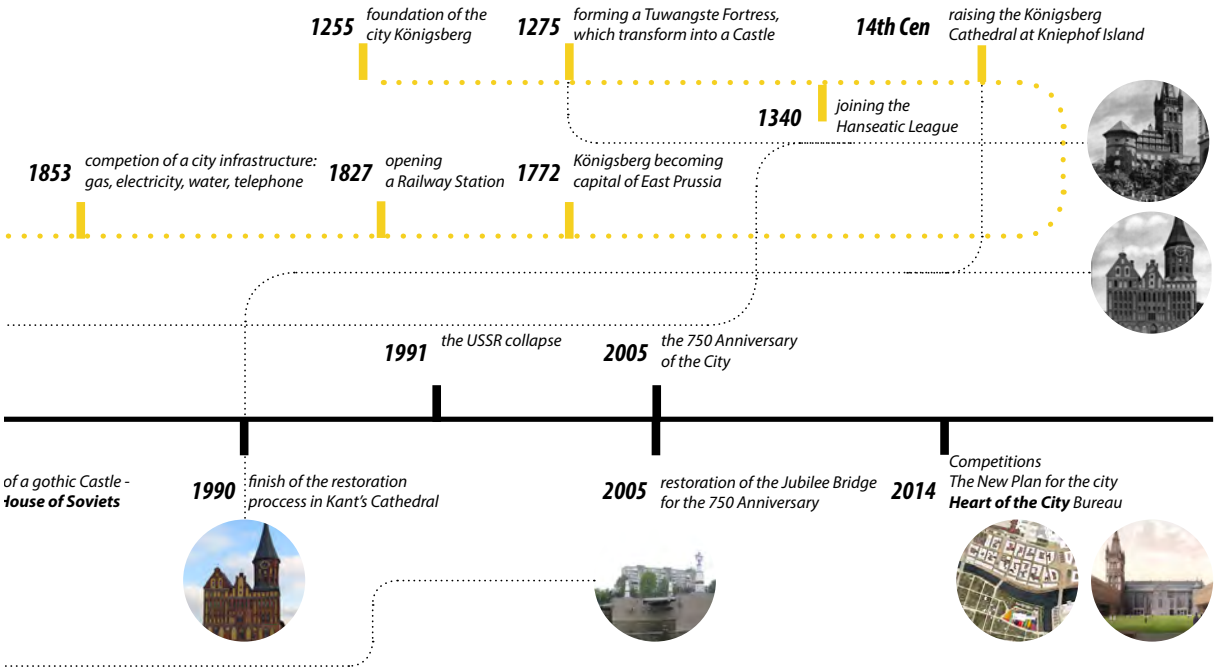
GOTHIC CATHEDRAL

Königsberg Cathedral was built in the 14th Century and originally it was designed as a fortification. It stood in the Eastern part of the Kneiphof Island (the bishops' district). In the beginning it was used as a catholic church, and after the reformation in the 16th Century it became the main Lutheran church of Prussia.

After the Second World War, the Cathedral shared the fate of every building in the a city centre, and after being bombed in 1944 it burnt down. Floors, towers and major part of the walls were destroyed, but thanks to its defensive function from Medieval times (walls with a thickness of 3 metres), the cathedral was one of the best preserved constructions in the city.

After the war, the Cathedral was strongly considered a symbol of the German past and therefore, it was dedicated to destruction. The crucial argument against this was the hidden tomb of philosopher Immanuel Kant, which was in a mausoleum adjoining the northeast corner of the cathedral. Kant was an author of ideology fundamental for the works of Karl Marx (a founder of socialist ideology). Due to this, the demolition of the Cathedral was rejected and Kneiphof changed its name to the Island of Kant.

In the 1970s the ruins were secured, which led to the first reconstruction process that began in 1990. Now it is one of 2 existing gothic churches in the city. The function of the Cathedral is not sacral anymore, although it is used for cultural events (Jasieński 1994; Szczepański 2008; Belintseva 2002).



THE NEW PLAN FOR THE CITY

In 2014, the bureau "Heart of the City" announced an international urban planning competition "Korolevskaya Gora (King's Mountain) and its surroundings". The subject area included 56 hectares part of the city centre. The main question was if this complicated and disparate space should be rebuilt or restored. The winner (out of a total of 40 participants) - Nikita Yavelin's Studio 44 proposed keeping Kneiphof Island as a park and having the former part of Altstad become a zone of archaeological investigations, with a new medieval city growing on the same grid as the ruined one. This approach referring to historicism, widely practiced in Western Europe, is for Russians something new (Cwietajewa 2013).

The ideas of the winners Studio 44 (Saint-Petersburg) and Devillers & Associes/Off-The-Grid Studio (Paris/Moscow) - were taken for the Consolidated Planning Concept for the development of the historic centre for the period 2015-2035. Since Russia is an organizer of the football World Cup in 2018, the concept also creates solutions for a fan-zone and transport scheme for this event.

13. The Jubilee Bridge before II World War

14. The Jubilee Bridge nowadays

15. The winning project - studio 44

16. The winning project - studio 44

12. The Fishing Village

17-18. The winning project - Sagal

CASTLE PROJECT PROPOSAL

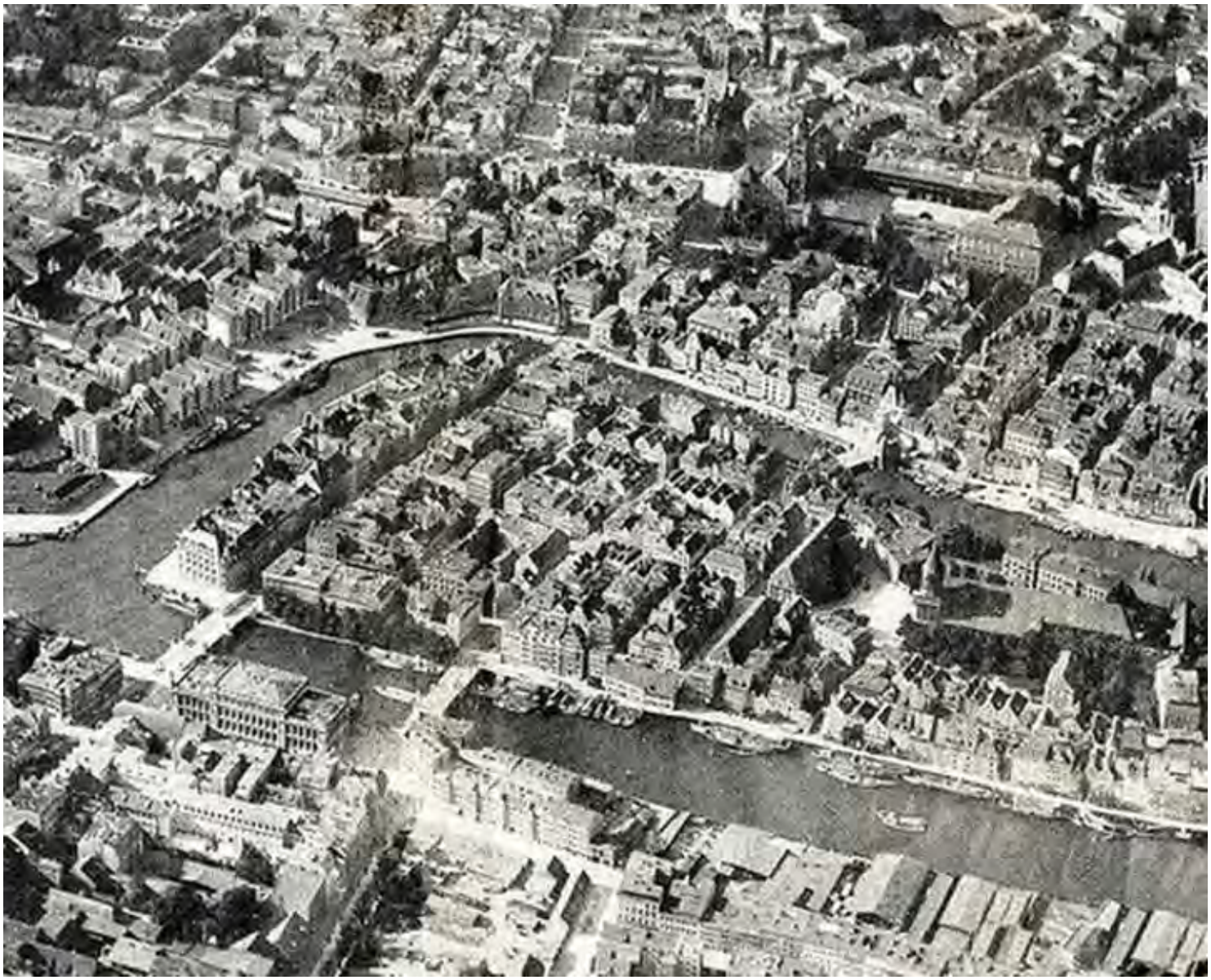
In September 2015 the results of the second competition "Post-castle" were published. The competition was a continuation of the first one and considered the implementation of the Consolidated Planning Concept to the projects. The Architectural Design refers to the Historic and Cultural Complex on the site of the former castle. The winner was Russian architect Anton Sagal from Individual Entrepreneur "Alexander Timokhin". The jury appreciated the quality of the draft and the idea of creating several public spaces. Sagal's proposal, named "Another Castle", concerns the reconstruction of part of the castle with the addition of four contemporary wings. The area surrounding the castle is designed as 5 new public spaces: Convent Square, Museum Square, Courtyard, South Terrace and Main Square (Brink 2015). In April 2016 the project of the winner was brought for an expert panel discussion and in the middle of May 2016 it was published with open access on the "Heart of the City" Project website, where more information is published about these two competitions. (website of " Heart of the City"; Fillppova 2015)

SUMMARY

Plans for city development that were formed between 1953 - 1969 show that the main priority for the city is transportation (check: Soviet modernism - urban planning). Historical quarters were roughly removed, creating enormous spaces which was used for car lanes. The saddest damage that the Soviets have done to the city's history, was destroying the Castle and placing the House of Soviets on the same site. This shows how strongly the government wanted to separate from the foreign heritage. An interesting fact is that the Bishops' part Kneiphof has never been rebuilt, so the historical part of the city is still a wild park, waiting for planning decisions.
What we can observe today is a return to the old times. It is probably caused by a lack of integrity and identity of the city, and the citizens need to search for them. Some of remained historical buildings are coming into the limelight, adapted to new functions. Moreover, discussion about the new development of the centre is still alive and by the programme "Heart of the City" there are more and more projects being created for this place.

What conclusions we got from our research? Firstly, it's impossible to forget about the genius loci. When you cut out the history, even after 70 years you may feel sentimental about it. Secondly, political situation can affect rebuilding process, it decides about city's growth or decline.

19-20. Public spaces around the House of Soviets



21. View of the Island before II World War

22. Actual view of the Island

4. SZCZECIN
THE CITY WHICH WAS LOOKING FOR THE WAY

Mentor (Othman Al-Mashhadani)
PhD student (Marta Rusin)
Joanna Wirkus, Julita Żuk

HISTORY

Szczecin is the capital city of the West Pomeranian Voivodeship in Poland. It is a major seaport and Poland's seventh-largest city. Located near the Baltic Sea, at the mouth of Oder River. It **gained city charter on the 3rd of April 1243**. From that time the city had a difficult history. In XIII Szczecin became a Hanseatic town. After the Treaty of Stettin in 1630 it was occupied by the Swedish Empire. However in 1713 the town was incorporated into Prussia. During 1724-1740 new fortifications around the city were built, which was starting point for demolishing the medieval city structure. In the late 19th century Szczecin became an industrial town, served as a major port for Berlin.

During World War II Szczecin was one of the most active German harbors and centre of industrial production including growing war needs. Later city became a resistance spot for Soviet troops, who wanted to reach Berlin. In April 1943 Szczecin was bombed for the first time by Allied aviation, which destroyed southern part of the city. A year later another bomb attack destroyed the northern districts. However real catastrophe started in August 1944 - bombing has made almost complete destruction of Szczecin. 60% of buildings were in ruins. It has caused total destruction of the Old Town with most of monuments, port and shipyard, many other industrial companies and finally entire residential districts. In **1945 Russian army conquered Szczecin and Polish authorities** were permitted to take power.

1962 *restoration of the northern wing of Pomeranian Dukes' Castle*

1965 *competition for the concept of development - **Centre of Szczecin***

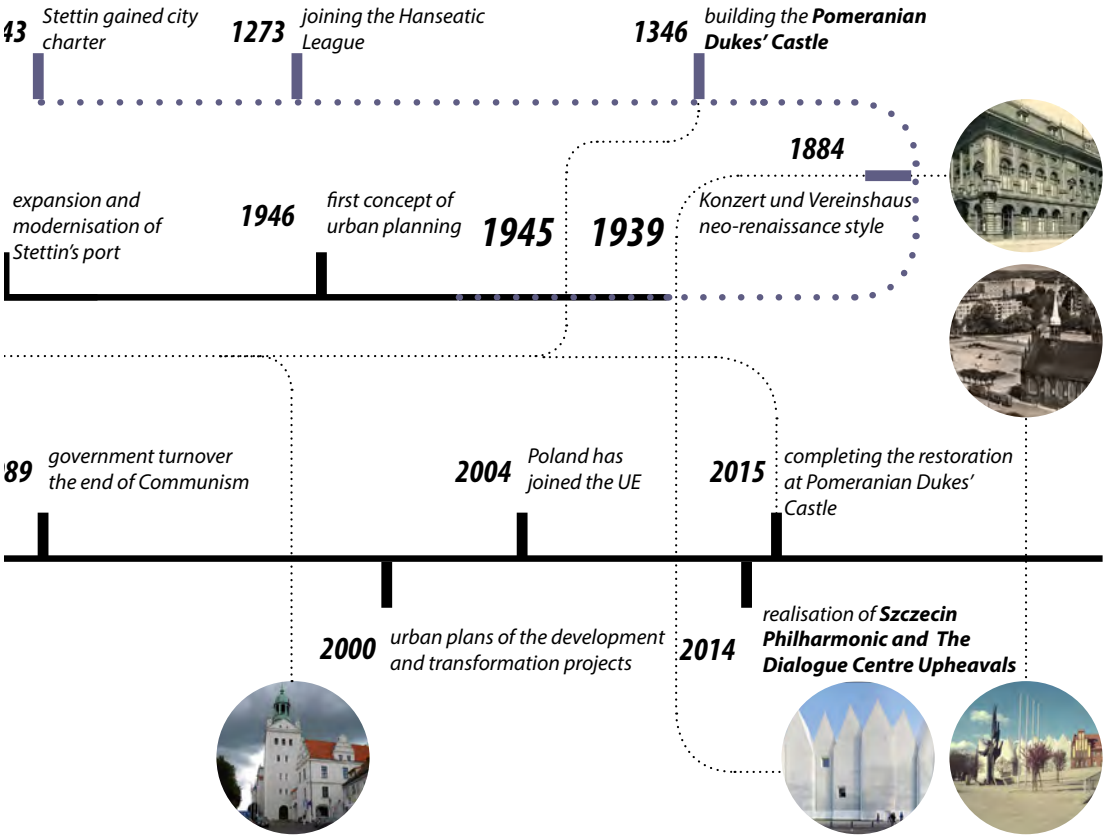
1950 *a nationwide competition for the concept of development called 'Center of Szczecin'*

1948

1970 ***St Jacob Cathedral** after war, in 70's and nowadays*

1. View of city in '30 of XX Century

2. Stettin before II World War



After the II World War Szczecin was transformed from a German into a Polish city. During post-war times Germans residents were forced to leave the city and Szczecin received many new polish inhabitants. Those residents were mainly new immigrants or displaced people from other parts of Poland.

Regarding the post-war situation 20th century was full of plans concerning development of Szczecin - plans and ideas for further spatial development of the city. The government attempted at implementing those plans, but usually it lead to unrealized competition ideas or projects which execution was postponed repeatedly. With passing time, in many cases this situation paradoxically seems to have a positive effect. Szczecin became a major Polish industrial centre and an important seaport. However after 2000 there has been made significant innovative decisions. Inhabitants noted potential of the city and there was a change of the policy, people started to take care about improvement and modernization of Szczecin.

3. Szczecin today

4. Map of Szczecin

1.The Harbour Gate
2.Podzamcze
3.Pomeranian Medical University
4.St. Jacob Cathedral Square of Prussian Homage
5.Square of Prussian Homage
6.The Dialogue Centre Upheavals
7.Pomeranian Dukes Castle

5. Szczecin in 1945
- view on the Castle

ATTITUDE TOWARDS POST-WAR REBUILD PROCESS

Approach to rebuild process was not very strict and it was chaotic. There was no guideline for rebuilding. Municipality after the II World War tried to respond to inhabitants needs mostly and built residential districts without keeping the old layout of building. The reconstruction concept of pre-war appearance of Szczecin was based only on changes in the urban structure, which was badly damaged during II World War. However those actions had some advantages. An interesting sociological phenomenon was fact of fast integration of people from various parts of the country, from different social groups, in conditions even more difficult than in other parts of Poland destroyed during the whole war - more than half of the city was destroyed. Society has to began all from a scratch, each one of the residents had a chance to gain some achievements and advancement, along with residents of growing city (Janowski, 1968).

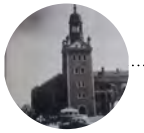
The approach to the rebuilding process was not only reconstruction, but conscious transformation and modernization of the urban organism with brave attitude to the future. These principles were accepted by **urban planning concepts** done from **1946 to 1947**, becoming the basis for planning of Szczecin. (Janowski, 1968). City authorities decided only to maintain historical public spaces and general layout of previous urban structure. There appeared foundations of a new city centre at Independence and Liberation Avenue.

6. Pomeranian Dukes Castle, 1945

7. Pomeranian Dukes Castle, 1965

8. Pomeranian Dukes Castle today

9. St. Jacob Cathedral, 1945



1962 *restoration of the northern wing of Pomeranian Dukes' Castle*

1950 *a nationwide c of developmer*

1965 *competition for the concept of development -* ***Centre of Szczecin***

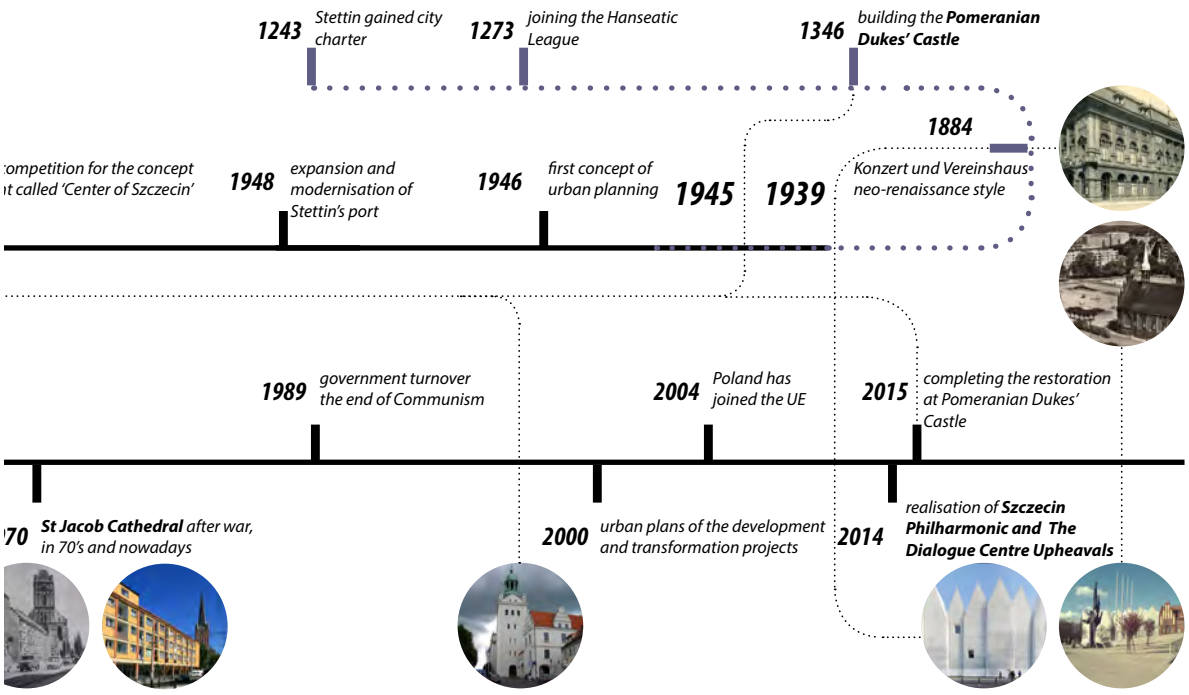
19

10. St. Jacob Cathedral, 1965

11. View of St. Jacob church with surrounding buildings, 2015

According to the original plans undeveloped areas could in fact be refurbished and used later without huge restrictions, which was specific for times of Polish People's Republic. This political system had significant influence on changes about the way of thinking about urban space. Society began to appreciate the value of historically shaped structure of the city, taking up actions towards reconstruction of neglected buildings and quarters. It was important to find lost identity so finally rebuilding of the Old Town on Podzamcze was taken into consideration (Czyńska, 2006). However the Old Town was rebuilt in the late 1990s, with new buildings, some of which were reconstructions of buildings destroyed in World War II.

In late 60's urban planners started to think about opening city to the river, from which it was cut off by communication routes. Society supported development projects of islands on Międzyodrze, where was a plan of location of the 'new city heart'. City authorities organized many different competitions: a new nationwide competition for the concept of development called 'Centre of Szczecin', competition for the reconstruction of the Plac Zgody square, development of Zwycięstwa Square, transformation of areas called Międzyodrze. Most of them were not realized or partly built. City authorities consciously were changing attitude of the rebuild process many times. That situation was caused especially due to the lack of historical bonds with the rest of Poland. The city was cutted off the river, which had been basis for the creation of the city.



However, in the 90's city authorities began to form new concepts of city development. It started on Podzamcze district, where property owners on that area decided to restore here a pre-war buildings in modern style. This idea was partly realized- only a few buildings had been constructed, because some plots have been sold to developers who wants to build here a shopping mall. However, until this year there were formed only couple of planned houses. With passing time projects of individual buildings became out of date. Reconstructed part of this district was not so extensive and broad to compete with the nineteenth-century post-war city centre. There is a lot of interesting architecture, but unfortunately it does not match to reality, because of incompatibility of the initial assumptions for the reconstruction. Apartments in this area are quite expensive and potential investors would have some other problem for example difficulties with finding parking spaces.

The latest view of revitalization of damaged areas in Szczecin is based on satisfying needs of residents, which are constantly changing and also on tourism development. The new policy of Szczecin would like to open city towards water, which have been forgotten in recent years. Water was also the inspiration for creation of Szczecin's brand strategy in 2008. Future Szczecin was expressed as Floating Garden with the prospect of realization this vision until 2050. This plan assumed building of 2 or 3 icons of modern architecture that will attract tourists and investors to the city. Eventually it was also decided to return the old urban structure.

12. Buildings of the old town before II World War

13. Existing houses on Targ Rybny street

14. Concert Hall (Konzerthaus), 1910

15. New Concert Hall, 2014

16. View of the Square of Solidarity, 1964

17. Center of the Dialogue Uphevals, 2015

From 2000 it was stated that city wants to prevent its historic value. Good example is Konzerthaus from XIX, which was damaged after II World War due to communist policy. In 2014, exactly in that place was built Philharmonic of Szczecin, which became well-known icon of the city. The Philharmonic of Szczecin does not distract attention from history of the city. It is a tourist attraction, which improves the economy of the city and increases enthusiasm for further development.

18-19. New vision for Bulwar Gdyński in Szczecin

SUMMARY

For several years the image of Szczecin was very poor if talking about the western port cities. The city was perceived as a sad, not attractive for both tourists as well as for investors. The most recent plans in Szczecin want to change this image, make the city more user-friendly and catching eyes in better way. Szczecin has a huge potential, especially due to its location by the river, which for a long time was squandered. However currently Szczecin is changing very quickly. The city authorities want to make it open for new businesses and an attractive place to live, with respecting its history and valuable buildings. Contemporary realizations and projects refer to the pre-war character of the city. At every step there is a possibility to meet with references of a long and difficult history of Szczecin.

Today the form of the city is highlighted by harbor, which during past years was a base for the development of Szczecin. It indicates the character of the city. The buildings in the city are different from each other. There is a possibility to meet old German quarters in downtown form the turn of 19th and 20th century and on the other hand some modern buildings, which were built after the war.

History of Szczecin shows that the post-war reconstruction was chaotic and not always well considered, but it started to go in better direction nowadays. We observe that Szczecin lost its historical value, because of too fast rebuilding process without respecting its history. Its identity was created by new inhabitants. Despite the fact that Szczecin had not any strict guideline for rebuild process, inhabitants, became integrated due to fast rebuilding of the city. This shows that Szczecin, as well as other cities under the rebuild process, should continue protecting the spirit of the city by reconstructing important historic places and giving them the new quality.

20. View on the Szczecin before II World War

21. Actual view on the city and Oder River

5. HAMBURG
THE CITY WHICH PROTECTS ITS S

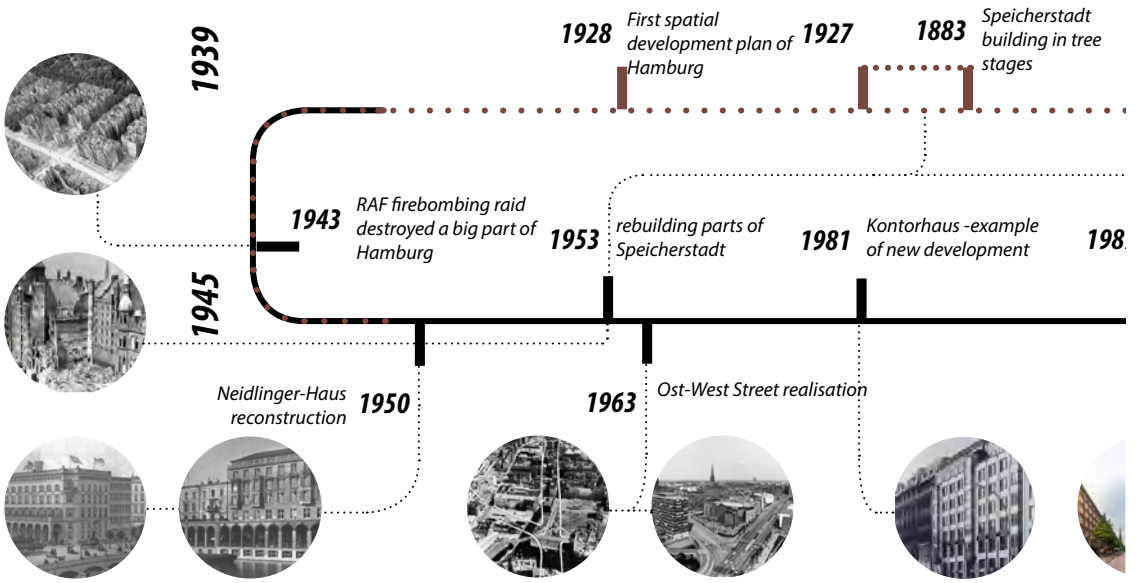
Mentor (Othman Al-Mashhadani)
PhD student (Marta Rusin)
Martyna Sprengel, Aleksandra Talko, Anna Wiecz

THE HISTORY OF HAMBURG

Hamburg is a city with a long maritime tradition, which history began already in 9th century as a mission settlement. In 1241, the city formed with Lübeck the first formal alliance, which was a prototype of Hanse. In the agreement, both of them committed themselves to protect together trade routes on sea and land, especially in the lawless territory between the Elbe and Trave rivers. The league, joined later by other trade cities, dominated commercial activity in northern Europe from the 13th to the 15th century.

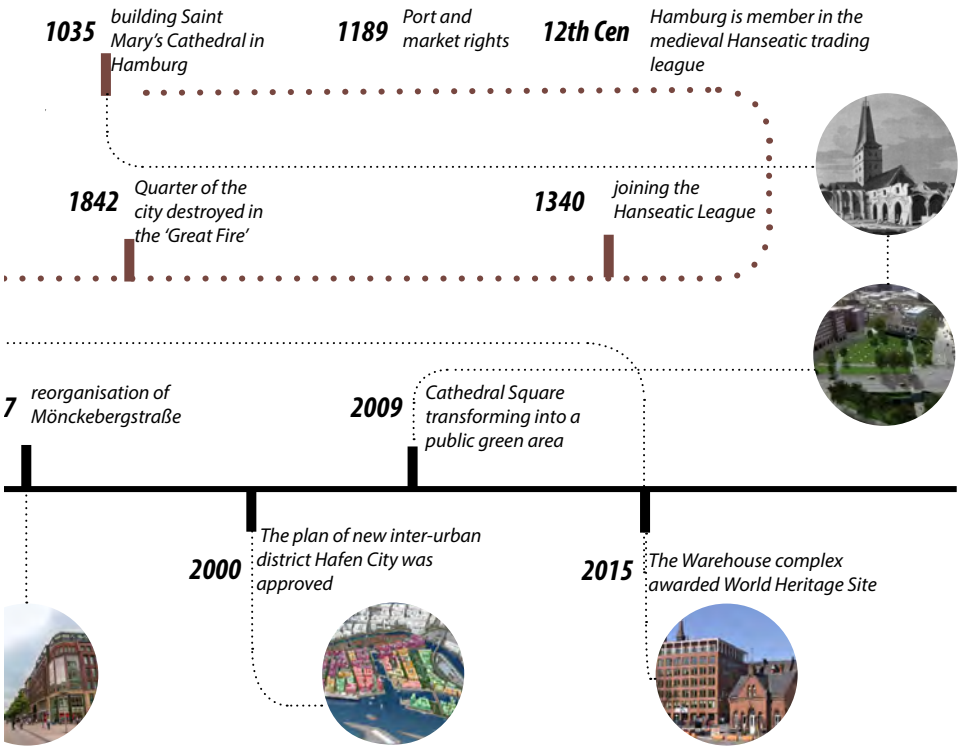
The city of Hamburg was damaged several times during its history, including **the "Great Fire"** in **1842**, which lasted 4 days and destroyed about quarter of the inner city. However, the biggest wound was destruction, caused by allied **bombing** in **1943**, which turned into ashes about half of the city and changed the image of some places for years. During the rebuilding process the main goal was to protect the history and 'the spirit of the place', but without reconstructing the actual urban tissue.

Legal urban planning for Hamburg began already before World War II. In **1928**, the **first spatial development plan** was created by German Academy of Urban and Spatial Planning. Settlements were supposed to be located around system of communication axis starting from the centre of the city and creating nearby empty areas of natural landscape. The concept came back later after 1955.



1. Hamburg before II World War

2. Hamburg today



3. Map of Hamburg

1.Fleet Island
2.Fleet market square
3.Cremon Island
4.Hafencity district
5.Neidlinger-Haus
6.Domplatz
7.former block R
8.Ost-West Street
9.Speicherstadt Kontorhaus

APPROACH TOWARDS REBUILDING PROCESS

Although right after war damage building housing estates was the most urgent need, preserving an urban image was not less important. Fritz Schumacher, a city's building director from 1909 to 1933, in his speech in 1945, noticed: "Already the next generation will only know from books, how Hamburg's towers and cityscapes looked like. This is fortunate, because it is useless to mourn about something irretrievable, but it is a disaster if the "spirit of the place", which was in irretrievable, is no longer kept in the heart of creators" (Schwarzkopf, Schipporeit, 2012). In the first years there was a variety of concepts on "recovery of the image of the city", but the main goal of the Monument Preservation Office was to keep "the character of the city". Main churches and all buildings, which had any historical value were then chosen to preserve. In 1948, planning law was also updated. It regulated some features of the new developments, like the height of eaves, the finishing of the facade made of plaster or natural stone and the shape of the roof, which should form a "visible pitched roof". Those rules were introduced for example in reconstruction of Neidlinger-Haus, which is situated near the main square. Another relevant aspect for preserving the cityscape was preserving the crown of the city, which meant important points of view on the skyline, especially church towers and a tower of the city hall (Schwarzkopf, Schipporeit, 2012). Almost all building projects after 1945 had to respect this requirement, and it is an important concern also nowadays. In years 1945-65, the approach towards rebuilding was influenced by the modernistic idea of "segmented and scattered city". On the ruins left by bombing, a big arteria called Ost-West Street was created. New buildings in area around this development were formed as solitary structures, surrounded by immense free space. Some of them began to interfere with the skyline because of their height. Since 60s of 20th century, precast elements for building flats were used. It resulted in a rapid construction and aging buildings, which often lack well organized public spaces. Some new office districts, like City-Nord, were created outside the city centre and took over the pressure from the historical part. It protected the downtown silhouette and at the same time allowed the city to develop. An important place was also Speicherstadt – a Warehouse district, located in the port of Hamburg. It was destroyed in about 50% during allied bombing. Most of the objects were rebuilt in a modern way, with introducing new functions like offices and only referring to gothicizing, brick, historical architecture.

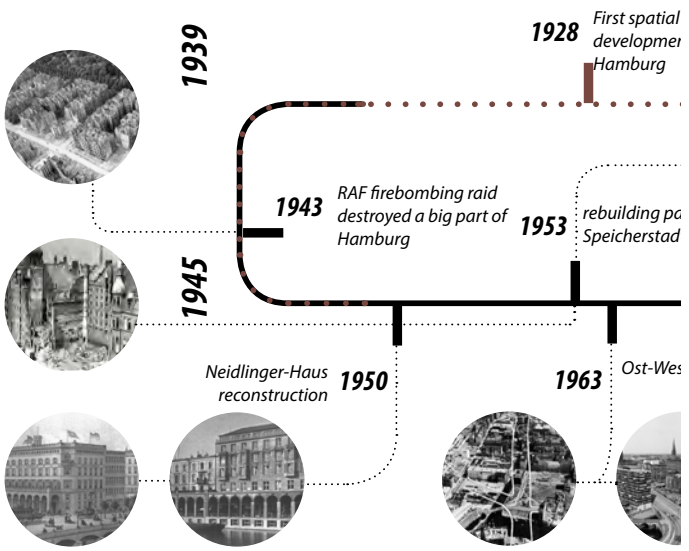
Since 70s, the city started to counteract against car-friendly policy and separation of functions. Gradually, it was returned to a dense and compact urban development and fine-structured city plan. Some districts, like St. Pauli or Eimsbüttel, started to be renovated. As a result, living and working was brought closer together. Many public spaces were reorganized through calming the traffic (example of Mönckebergstraße) or giving the space back to pedestrians. In some places, new developments rather freely interpreted historical layout (like on Cremon Insel) or kept the scale of historical urban tissue, combining it with contemporary means (example of Kontorhaus opposite to the Main Station). Generally, the tendency was to respond to current people's needs by creating new public spaces (like Fleet market square) and introducing mixed-use developments, that were supposed to raise the attractiveness of the inner city.

5. Ost-West Street in 1950

7. Ost-West Street in 1960

4. Hamburg in XIX Century

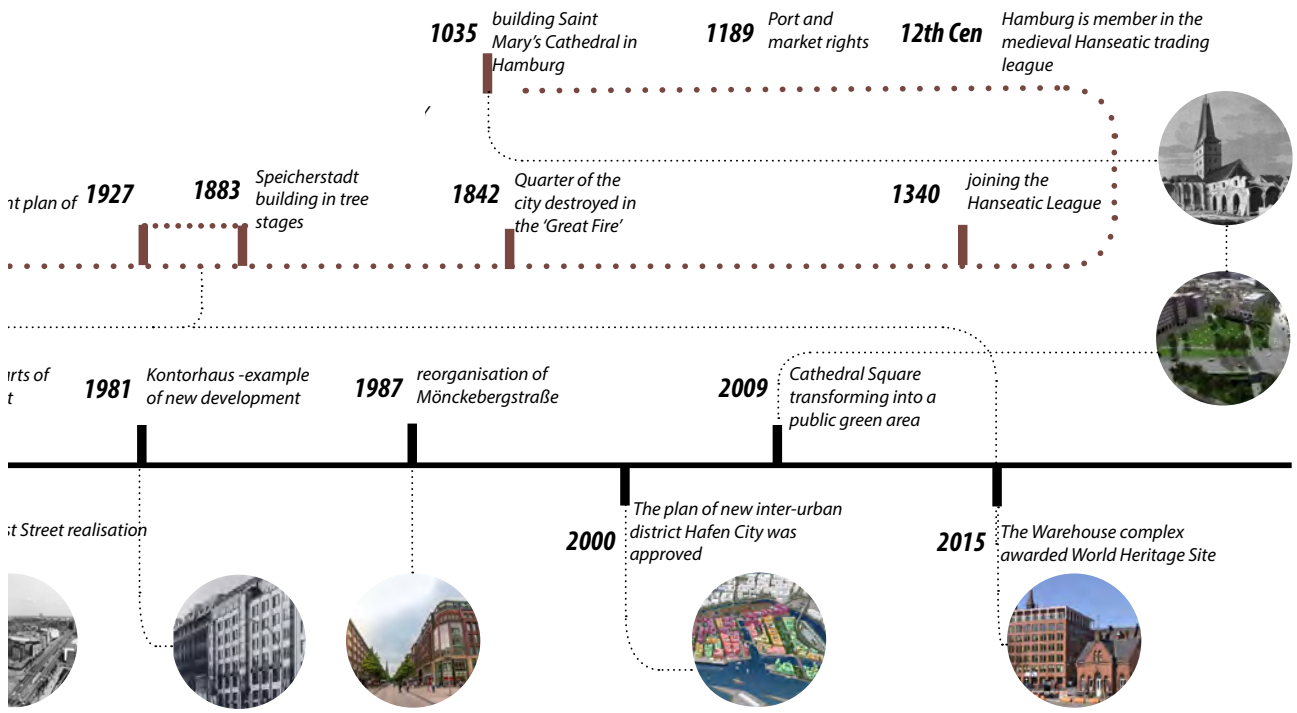
6. Hamburg in 1943



8. Neidlinger-Haus and Alsterarkaden before war (about 1880)

9. Neidlinger-Haus and Alsterarkaden after rebuilding (1950)

Since **2000**, new realizations are located mainly in **Hafencity district,** which is a post-harbour area. Around 70 percent of the warehouses and almost 90 percent of the dockside storage sheds were destroyed during allied bombing. In new developments, numerous historic references are clearly recognizable, such as structure of quarters and materials of facades. Some historic buildings were also retained, like Warehouse in Elbphilharmonie Concert Hall. Hafencity district establishes dialog between old and new and forms a contemporary, attractive space that also contributes towards keeping the "spirit of the city". Important feature of the masterplan for Hafencity is its flexibility, which enables better adaptation in the future. The past has played also an important part in another project, the Cathedral Square in the area of Old City. It is a place with a rich history, where previously a St. Mary Cathedral and a classicist school were located. An empty plot was transformed into public green space, complying with requests of residents. The historical pan of the cathedral is marked only by elements like seats. It shows the tendency to value and adapt ongoing projects to the needs of inhabitants, but with respect and reference to the history at the same time.



10. Saint Mary's Cathedral

13. Kontorhaus built 1981-84

15. Actual view on Hafencity

11. View of The Cathedral Square, 2006

14. Fleemarkt and a Steigenberger Hotel built between 1991-92

16. Mönckeberg Strasse

12. New project of The Cathedral Square,2009

17. Warehouse district in Hamburg. Ruins of block R in 1944

18. Rebuilt duty-free port office in 1952/53

19. Approved Hafencity masterplan

20. Hafencity model from 2010

21. Project of Olympic Stadion 2024

SUMMARY

Hamburg is the example of the city which succeeded in keeping its pre-war identity during the rebuilding process. Rebuilding and reconstruction of damaged areas was very comprehensive. One of the most important aspects was preserving the general urban layout and the spirit of the city. From the very beginning, guidelines for architectural appearance of new buildings were introduced, which enabled to create contemporary architecture with respect towards the past. Objects with the highest historical value, like churches, were chosen to preserve. The skyline, composed of towers of churches as the crown of the city, was regarded as very important and should have been considered in every new development. In spite of experiments, carried out on urban tissue, like big arteria through the city centre or high modern office towers, rebuilding of the city turned out to be a success and the spirit of the place, mentioned before, was kept.

One of the conclusions from research is that it is important to choose significant historical traits to preserve them and to create guidelines for new developments. Also experiments on historical urban tissue should be avoided, as they might turn out to be problematic for the image of the city years later.

22. Hamburg before war

23. Hamburg nowadays

6. GDAŃSK
THE CITY WHICH PUT NEW QUALITY IN OLD STRUCTURE

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PhD student (Marta Rusin)
Alicja Walkusz, Krystyna Warsińska, Anna Wieczorkowska

997 *first mention about Gdańsk in Lifeof St. Adalbert*
1235 *city rights under Lubeck Law*
1308

HISTORY

Gdańsk is a city with over a thousand years of very difficult and interesting history. Over the centuries, identity of the city was influenced by different cultures. Its growth owed location at the mouth of the Vistula river, which since 10th century was a waterway to the Baltic Sea for goods produced in Poland and neighbouring countries (Ćieślak 1978, Labuda 1969). Gdańsk was once the largest city of the Republic of Two Nations, a royal city and a member of Hanseatic League (PES 1935, Szermer 1971). The golden age of Poland was the sixteenth century - the time of growth and development of Gdańsk. The city was one of the richest in Polish Republic and also an important cultural centre. It was reflected in architecture and art. Gdańsk is considered as the symbolic place of the outbreak of World War II and the beginning of the fall of communism in Central Europe. In the city there are numerous architectural monuments, it works in the many institutions and cultural institutions (Szermer 1971).

Złota Kamienica *(Golden tenement house) after war and result of its restoration*

1948 *decision of the beginning of the rebuilding of Gdańsk in the Main Town*
1945
1939

1948

1989 *a government turno the end of Commun*

1955 *end of rebuilding of the* ***St. Mary's Basilica*** *after the war*

1960 *building the Stare Przedmiescie DIstrict*

1993 ***the Great Mill*** *for the shoppin*

1. Gdańsk with St. Mary's Church before II World War

2. Destroyed Gdańsk in 1945

Gdańsk came under a rule of Teutonic Knights **1360** *finishing the construction of the St. Mary's Basilica*

1361 *joining the Hanseatic League*

1466 *Gdańsk comes back to Poland*

1920 *The Free City of Danzig*

1793 *Gdańsk becomes part of The Kingdom of Prussia*

ver ism

1997 *construction of Hanza Hotel*

2004 *Poland has joined the UE*

2009 *the construction of Symphony Apartments*

rehabilitation g center

1997 ***the Stqgiewna complex*** *- the modern development of a 19th century tenement houses*

2014 *opening of* ***the Shakespeare Theatre***

3. St. Mary's Church today

4. Main streets of Gdańsk before II World War

5. Main streets of Gdańsk today

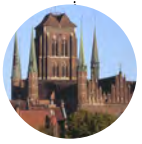
6. Map of Gdańsk

1. *Shakespeare Theater*
2. *Targ Węglowy Square*
3. *Uphagen House*
4. *Stare Przedmieście district*
5. *St. Mary's Church*
6. *'Kwartał Kamienic 'Stqgiewna' complex*

On the beginning of 1945 Gdańsk was one of not many cities of Third Reich land which stayed almost untouched by air raids. The situation of the city became much more tragic in the last days of March in 1945. The order of Hitler - "defend until the last soldier" - prohibited surrender and after 9th March has begun everyday bombing by the Soviet Army (Szczepański 2009, Szypowska, Szypowski, 1978, Wąs 2016). This raid was continued and in 25th March 1945 it touched whole historic city centre. Shaft to 28th March 1945 when the German troops were completely driven out (Gawlicki 2012, Friedrich 2015, Gruszkowski 1999). At that moment the devastation of Gdańsk was determined at 60% but the old monumental part - 90%. 6000 buildings were totally destroyed and 1300 partially. Today it is not completely clear whether this appeared designed to strengthen the capacity of Gdańsk for financing, because the total and uniform restoration would have to be financed by the state (Friedrich 2015, Trojanowska 1997, Szermer 1971). As a first target of destruction became sacred architecture monumental church towers that were a good place to hide snipers. Next it was a middle-class housing architecture and cities fortifications (Gawlicki 2012). In 25th March the city became polish again and after years of Freie Stadt Danzig transformed into new city Gdańsk. The city have got new inhabitants who had to challenged with reconstruction of city which was not even their before (Bugalski 2015).

7. The Town Hall after bombing

8. The Renowated Town Hall

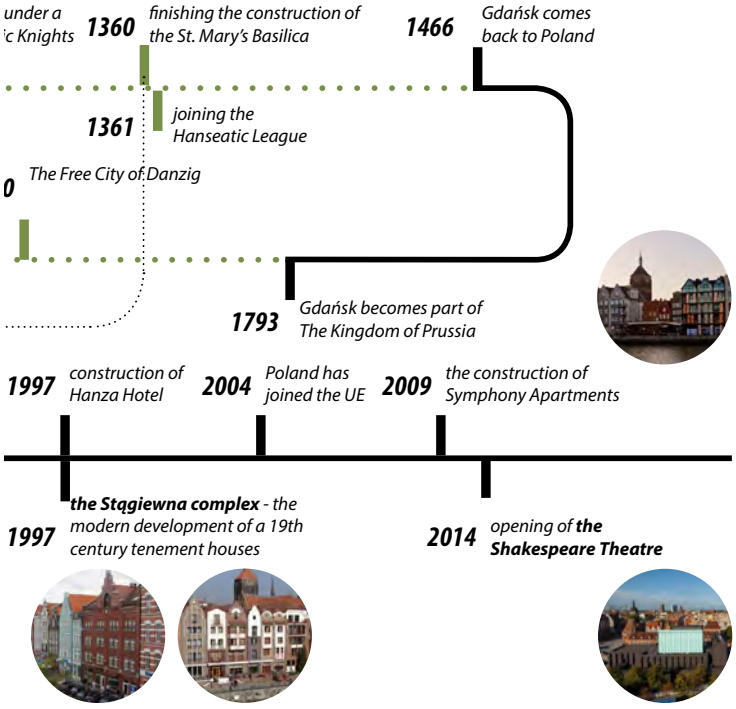


9. The Gold Tenement after war

10. The Gold Tenement today

SUMMARY

After WW II Gdańsk was rebuilt in way which we can call courageous , especially in contrast with the way of rebuilt German cities. In chosen approach to rebuilt the city, new Gdańsk was meant to repeat the pre-war look. This kind of decisions always raise the question whether it was a good decision, or if it led to the creation of inauthentic city (Friedrich 2015). Preserving the authenticity, continuity and variability of the city and architecture through the history is a very difficult challenge. It is especially hard in the cities that were severely destroyed. The city of Gdańsk is trying to combine the protection of the historic fabric with modern architecture and development. In our opinion, the city managed to keep and reflect its pre-war character and atmosphere.



11. Crane and city houses next to the Motława River

12. New Hanza Hotel

13. Gdańsk before war

14. Gdańsk nowadays

7. CONCLUSIONS

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7.1. OBSERVATIONS

Research on the rebuilding processes conducted in four cities, shows how different approaches might be chosen even in similar conditions: history, location or level of destruction. Moreover the research shown that the approach to the rebuilding process in the same city might change over the years. Below there are observations noticed by the team during the research.

The rebuilding process helps inhabitants to identify with the city, even if they are completely new residents.

GDAŃSK
SZCZECIN

City can lose its historical value if the rebuilding process is done without strict guidelines. It is important to put a lot of effort to create guidelines for rebuild process and try to avoid focusing on short-time decisions.

KALININGRAD
SZCZECIN

Well-prepared guidelines might be useful even decades later. The character of the city can be maintained even if the interiors of quarters and building layouts are changed in order to future users' needs.

HAMBURG
GDAŃSK

Experiments carried out on urban tissue, like big arteria through the city centre or high modern office towers are considered now as problematic for the image of the city.

KALININGRAD
SZCZECIN
HAMBURG
GDAŃSK

Political situation can affect rebuilding process, even if it is not directly connected with it. It can decide about city's growth or decline.

KALININGRAD

The last, it's impossible to forget about the genius loci. Even a long time might be not enough for the city to forget.

KALININGRAD
SZCZECIN

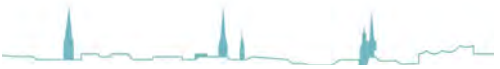
7.2. RECOMMENDATIONS

Basing on the observations the team has prepared a list of recommendations, which might be implemented in other places, for example the Middle East cities. Part of them are complemented with examples coming from the study cases.

1. Protect the spirit of the city by choosing its most characteristic historical traits and preserving them. Example? The skyline of Hamburg.

2. Put a lot of effort in creating main guidelines for the rebuilding process in order to lead its implementation in the future. Example? Conservation officer's regulations in Main Town in Gdańsk.

3. Involve multidisciplinary team of experts and facilitate active participation of citizens in the rebuilding process. Example? We are still looking for.



4. Establish the board composed of government, NGOs, local and international experts in order to coordinate the rebuilding process. Example? We are still looking for.

5. Don't follow current architectural or urban trends that can result in experimentation with historical urban tissue. Example? Szczecin and Nabrzeże Wieleckie Street.

6. Continue history with the new quality. Consider future users' needs and create a sustainable city. Example? Density in Gdańsk quarters and layout of tenement houses.

7. Support employment of inhabitants by maintaining old work places and creating new ones. Example? We hope that Middle East Cities will be a perfect example of that.

8. DICTIONARY

Balloon Test is a study, which consists in locating a balloon or a few of them at the height of the proposed building, in order to assess structure's visual impact on surroundings and landscape.

Berlin Wall (German: Berliner Mauer) was a barrier that surrounded West Berlin and prevented access to it from East Berlin and adjacent areas of East Germany during the period from 1961 to 1989. It was a reaction against events from years between 1949 and 1961, when about 2.5 million East Germans had fled from East to West Germany, including steadily rising numbers of skilled workers, professionals, and intellectuals. In response, East Germany built a barrier to close off East Germans' access to West Berlin and hence West Germany. Physically, the wall was made of concrete walls up to 5m high, topped with barbed wire and guarded with watchtowers, gun emplacements, and mines (Britannica 2016).

Bolsheviks A faction of the Marxist Russian Social Democratic Labour Party (RSDLP) which was a revolutionary socialist party that came to power in Russia during the October Revolution in 1917. The Bolsheviks, who considered themselves the leaders of the revolutionary working class of Russia, were founded by Vladimir Lenin and Alexander Bogdanov in 1905 (Oldberg 2001).

Genius loci According to Roman mythology, it's a spirit that is strongly connected with a particular place, which affect into creating an unique atmosphere (Czeczot 2013).

Hanseatic League An organization, founded by north German towns and German merchant communities abroad to protect their mutual trading interests. "Hanse" was a medieval German word for "guild," or "association," derived from a Gothic word for "troop," or "company". The first formal alliance, which was a prototype of Hanse, was formed in 1241 between two German cities: Lübeck and Hamburg, which agreed to protect together trade routes on sea and land, especially in the lawless territory between the Elbe and Trave rivers. The league dominated commercial activity in northern Europe from the 13th to the 15th century (Britannica 2016).

Historicism A style of recreating historic styles or artisans. Through a combination of different styles or the implementation of new elements, historicism can create aesthetics completely different from former styles - the result of this combination is called eclecticism (Whittick 1974).

Iron curtain The political, military, and ideological barrier erected by the Soviet Union after World War II (1945) and kept until the end of the Cold War (1991) to seal off itself and its dependent eastern and central European allies from open contact with the West and other noncommunist areas. On the east side of the imaginary boundary there were countries, connected to or influenced by the Soviet Union. On the other side, there were states which developed their own international alliances. Physically, the Iron Curtain formed border defenses between the countries of Europe in the middle of the continent, the most notable being Berlin Wall (Britannica 2016).

Polish People's Republic The official name of Poland between 1952 and 1989. The concept of creation the Polish communist state, which appeared for the first time in the environment of Polish and Russian Communists in relation to the idea of a world communist revolution.

Potsdam Conference Conference held at Potsdam in 17 July - 2 August 1945 on which were discussed the substance and procedures of the peace settlements in Europe but did not attempt to write peace treaties. The chief participants were U.S.President Harry S. Truman,British Prime Minister Winston Churchill (or Clement Attlee, who became prime minister during the conference), and Soviet Premier Joseph Stalin. In the Conference were set up decisions about occupation zones of Germany from Yalta Conference and also were made decisions like determination Poland's boundary (Britannica 2015).

Soviet modernism (urban planning) Soviet urban planning was dictated by ideological, political, social and economic motives. It started with the 1917 Marxist revolution, which brought attitudes that rural life was backward and resulted in inequality. Such ideals required the distinction between rural and urban, and it contributed to the formation of a common standard of living. Houses and apartments once belonging to the bourgeoisie were subdivided to provide accommodation for the proletariat.
In capitalist Russia, architecture was not influenced by great artistic ideals and its development was therefore lopsided. New types of buildings - for industry and trade - were designed successfully from an engineering and utility point of view. Standard plans were used for the central quarters of towns, and they lacked cohesion, looking motley and built at random. Unlike the urban development in Western countries, Soviet-style planning often called for the complete redesign of cities. Urban planners were commissioned to replace small, unremunerative enterprises with large ones, and reconstruct old, small-sized housing areas by building in their place well-appointed multistoried apartment complexes. The main basis in this process was that commuting time from housing to places of work should be not more than 30 minutes (Whittick 1974).

Stalinist neoclassicism During the period between 1929 and 1945, Europe was characterized by increasing political radicalism. With varying degrees of success, nationalist and totalitarian movements tried to assume power. Classicism had the task of giving expression to the existing forms of government and of contributing to their consolidation. For this purpose, architecture referred to the past. The return of forms of buildings used during historic and supposedly legitimate regimes was to justify the present government as well. The format of the buildings became monumental; size per se became the architectural means and backdrop for the demonstration of the power of a community (Lampugnani 1951).
Stalinist neoclassicism is a term given to architecture of the Soviet Union under the leadership of Joseph Stalin, between 1933 and 1955. Stalinist architecture is associated with the socialist realism school of art. Objects from this period must be: Proletarian (art relevant to the workers and understandable to them), Typical (scenes of the everyday life of the people), Realistic (in the representational sense) and Partisan (supportive of the aims of the State and the Party) (Dubravka 2002).

Treaty of Stettin Treaty of Stettin was the legal framework for the occupation of Pomerania (included Szczecin) by the Swedish Empire during the Thirty Years' War started in 1630. Thanks to this action Sweden gained military control and used the Pomeranian areas for campaigns into Central and Southern Germany.

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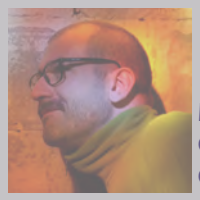
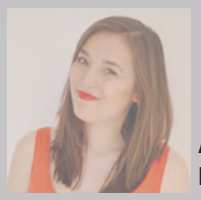
MEASURING THE IMMEASURABLE. RE-ARTICULATION OF BALTIC COASTAL DISTRICTS' IDENTITIES

The group research focused on a deeper understanding of the environmental sources of the identity of a place and the possibility of how it may serve as a base to evoke its prospects for the future development in terms of both planning and daily use. The group proposed an experimental approach for a new scientific method to be developed in the future. The goal was to test the role played by spatial identities as a catalyst to empower different future scenarios and to investigate how different spatial identities may be articulated to support future development processes. The idea was to organize spatial identities within a reference system - an atlas where they can be consulted and eventually picked up to be rearticulated inside a plan. Considering multiple theories on apparently interchangeable definitions of the character of the space, atmosphere of the space, sense of place and finally place identity, the group tried to correlate the intangible aspects and parameters that create the places with the design methods, that traditionally refer to objective data and measurable or defined features of the space. Through walking and empirical space explorations the team members gathered subjective information and qualitative data from the coastal districts of Gdansk. A wide range of uncountable and immeasurable data was collected, from nonvisual sensory experiences to meaningful spots important for the coastal identity of the district. Eventually, using this soft data and subjective information as a consistent system of data the group assigned specific design codes for future participative 'bottom up' development processes.



Mentor: Giorgio Gasco

Giorgio Gasco is a visiting assistant professor at Bilkent University, Department of Architecture. He studied in Torino (BArch) and in Barcelona (MArch, Ph.D.). He was visiting lecturer at the Barcelona Architecture Center where he offered seminars and lectures.



Agnieszka Billewicz

Engineer, Architect. Graduated Wroclaw University of Technology with a Bachelor Degree in Architecture and Urban Planning. Currently a Communication Design student, passionate about studying interactions between people and space/ products. Traveler.

Diana Osmańska

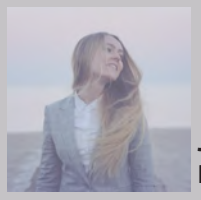
Diana studied architecture and urban planning on Gdańsk University of Technology and UACG in Sofia. Interested in topic of the interdependence of water and the city, floating architecture and waterfronts. Lover of city life.

PhD student: Katarzyna Urbanowicz

Katarzyna studied architecture at the Gdańsk University of Technology and at Roma Tre University in Italy. Her PhD research focuses on interactive artistic interventions in public spaces and their possible role in the city renewal processes.

Mateusz Kozłowski

Master Eng. Arch. by Education form Gdańsk, coming from eastern Poland (where the polar bears live). Interested in improving quality of people's everyday life which is not always associated with facilitation or simplification. Hiker, cook, drummer and SF/Fantasy books fan.

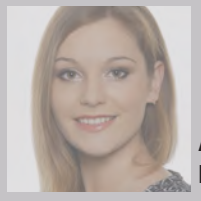


Joanna Rochman

Engineer, Architect, master's student at FA, Gdańsk University of Technology with an international experience achived at ETSA, Universitat Politècnica de València and DAD, Politecnico di Torino. Architecture lover addicted to travel and design.

Michał Bainka

The Master Engineer, Architect student at the Gdańsk University of Technology. Field of study: Architecture and Urban Planning. Current research on heritage of socialist architecture.



Anna Królikowska

Anna Królikowska, is a student of a master's degree on Gdańsk University of Technology, Department of Architecture. In the free time she is interested in sport, especially horse riding and travelling.

Piotr Żelaznowski

Studied architecture and urban design at the Gdansk University of Technology. Interested in modern cities' functioning and public participation. Frequent participant in workshops and conferences, both in Poland and abroad.

RE-ARTICULATION OF BALTIC COASTAL DISTRICTS' IDENTITIE FROM PERCEPTION TO PRACTICE. THE CASE OF THE NORTHERN URBAN EDGE OF GDANSK - INTRODUCTION (THEORY AND METHODOLOGY)

Giorgio Gasco (Visiting Assistant Professor at Bilkent University, Ankara)
Katarzyna Urbanowicz (Gdańsk University Of Technology)

A FEW WORDS FROM THE MENTOR

This work originates, I should admit, from my basic ineptitude to conceive and structure a real research project. I was perfectly aware of this when I accepted to participate in this Research Lab as a mentor. Yet I felt intrigued by the task and in particular I was very pleased to share this experience and to work with a very promising team of students and to collaborate with a very talented PhD student. So somehow we set it off, although with the deep sensation we were doing nothing but a leap of faith… Eventually we managed to produce a body of work, that in spite of its naivety, weak points, missing opportunities (the list of deficiencies may continue…), in any case stands as a courageous attempt to challenge the typical research criteria, and to construct, by the means of a systematic accuracy (when not obstinacy), a consistent sequence of procedures able to bring a convincing final result.

From one side we were lacking the support of an effective research method able to grant a certain result, from the other we were also tempted by the possibility to give the idea itself of "research" another value. What is the reason of a research? What is supposed to be the aim of a research? What is left, once the established realm of the research (to progresses towards a concrete purpose) is bypassed? Still does something remain? There is room to investigate something outside the standards of classical research? With some of these questions in mind we ventured into an uncertain terrain experimenting an empirical approach to investigate the system of Baltic coastal districts' identities. The second part of this introduction will illustrate the general traits of the process, the development, and the conclusions of this investigation. Here I wish to discuss about what for us has been the fundamental principle of these study: set a research work out of a paradox.

Measuring the Immeasurable… this is our paradox. The attempt to quantify what does not have any dimensions (qualitative data – parameters able to constitute different identities). The ultimate sense of this operation, was not the measure, the possibility of quantifying in itself, but the very work necessary to structure the senseless nature of this attempt. What is a mere qualitative datum (immeasurable) remains invisible in the background, yet it may appears to the foreground when it is assigned a value (subjective). It becomes "visible". This was out small magic: to shift our parameters from an ordinary invisibility to an unexpected visibility. To subtract them from the indifference, to give them a name, to bring them in relation one to each other, and eventually to assign them a possible role within future practices. The design codes: the final venture!

What for? I don't want to diminish the actual value of this method for future applications, just what matters to me at the end is to emphasize the value of this experience as an extraordinary attempt to organize the fortuitous disorder of the reality. Eventually the very nature of this study, in particular represented by all the diagrams and the systematic catalogue/matrix of the parameters, rests in

a precious insane aim: to decipher the reality as an aesthetic act.

If I don't have strong analytical research methods, I have great masters though, whose lesson may stand as a theoretical background for this study. I wish to mention two of them here, Georges Perec and Italo Calvino.

In his work *L'Infra-ordinaire* (Perec, 2008), Georges Perec offered most probably the best example on how to deal with an investigation "autre". As for Perec the literature itself is a genuine research activity, a form of interrogation of the quotidian, a way of illustrate the hidden value of small events and the most minimal of situations. His constant process of questioning the habitual, has been without any doubt a strong reference at the beginning of our work. In particular then his obsession for the systematic organization of his observations within endless lists that sounds like lullabies, enchant and eventually evoke another reality. His exercises in observation are a real demonstration of a method.

Italo Calvino is another writer who conceives literature not just as a form of telling stories and constructing narratives, but as an exploration of the reality. I like to recall here the exercises in the description of the vagueness and the indefinite that he assembled in his book *Mr. Palomar* (Calvino, 1985). Mr. Palomar (the character of the book) engages in very detailed observations of the complex, yet at the same time ordinary natural phenomena. In the episode "Reading a Wave" for example, Mr. Palomar attempts to see and describe and capture into language the exact features of a single wave (Calvino, 1985: 3-8). His descriptions, which are continuously revised, are constantly accurate and constantly inadequate. Needless to say they are impossible descriptions that drive the dear Palomar on the verge of a nervous breakdown. Actually what matters in these descriptions is not to succeed but the attempt in itself, as a kind of exercise of precision carried out through the accuracy of the language. The language of "exactitude" becomes the very tool Calvino advises as essential in order to express the vagueness of similar phenomena. As he states in his *Six Memos for the Next Millennium* (Calvino, 2009), the language of the "exactitude" entails:

a highly exact and meticulous attention to the composition of each image, to the minute definition of details, to the choice of objects, to the lighting and the atmosphere, all in order to attain the desired degree of vagueness. … The poet of vagueness can only be the poet of exactitude. (Calvino, 2009: 58, 60)
Eventually Calvino remind us that it is necessary to be absolutely precise to capture all the indefiniteness of the reality.

THE REASONS OF ANOTHER RESEARCH

The goal of the research work presented here was to test an empirical approach as an experiment for a scientific method to be developed in the future. It was a first trial step to provide a the architects, urban planners, investors, City Council, NGO's and even city dwellers with the support tools that would facilitate the creation process of a high quality urban development with the focus on recognizing and then respecting the unique character and identity of the places.

Traditional city planning processes consider mainly the measurable and visible aspects of the cities and it's spaces. The are some "blindspots in the comprehensive art of city making", to use Charles Landry's wording, which are sensory appreciation, the emotions, environmental psychology, cultural literacy, artistic thinking and diversity (Landry, 2006: 240). Since 1960's the discipline of urban design started its development, searching for the urban space quality. Several schools of thought emerged, including The visual-artistic tradition – focused mainly on visual qualities and aesthetic perception of space, The social usage tradition – focused on the use of space, perception and sense-of place, and The making places tradition – that would combine the two traditions (Carmona, Tiesdell, Oc

& Health, 2003: 6-7). There are numerous contemporary concepts that focus on the important aspects and 'blindspots' of the city design, like Sensorial Urbanism (Zardini, 2006), Cultural Planning (Bianchini and Parkinson, 1993), Creative City (Landry, 2013), revitalization with art (van Gestel et al., 2009; Whybrow, 2011; Bressi – web page), etc. Nevertheless, it is still difficult and hardly practiced to consider all the 'blindspots' in the practical city development. As Koltsova, Kunze and Schmitt (2012: 403) notices, "one of the great challenges that is crucial for the development of design support tools is that much of the data in the design process has a non-mathematical nature. It is hard to identify the parameters of urban form that are quantifiable and that can be implemented within parametric/procedural software". The group has taken a challenge to collect and transform the set of subjective information that form the coastal identity and 'genius loci' of the northern districts of Gdansk into a consistent system of data to assign specific Design Codes for future participative 'bottom-up' development processes. It was an experimental task to find a solution for filling the gap between theoretical approach of strict design codes based on quantitative data and urban explorations based on soft immersive data and information.

The work was divided into 3 main steps:
1. Exploring Identities / Data collection - 'measuring the immeasurable'.
2. Framing Identities / Data organization.
3. Re-articulating Identities / From identities to design codes - data visualization (Interpolation).

1. EXPLORING IDENTITIES AND COLLECTING THE DATA

Place Identity, the definition presented by Harold Proshansky, Abbe Fabian and Robert Kaminoff in 1983, consists of "knowledge and feelings developed through everyday experiences of physical spaces" (Gieseking, Mangold, et al., 2014). In this time many other definitions describing place uniqueness and characteristics have been formed, considering different approaches on the aspects that create the general atmosphere, ambience and mood of the space. Already in the 70's such approach appeared and it developed through time, with the 'The Image of the City' by Kevin Lynch (1960), the 'Invisible Cities' by Italo Calvino (1972), 'Space and Place' by Yi-Fu Tuan (1977), the description of the "qualitative total phenomenon" and of the space by Christian Norberg-Schulz (1980), who calls it the 'character' or 'atmosphere' of the place. These terms, and especially 'genius loci', 'the sense of place' (Cullen, 1961; Steele, 1981; Walter, 1988; Jackson, 1994), 'place character' and 'atmosphere', in the post-war period have tended to be used "indiscriminately and interchangeably" (Jivén & Larkham, 2003).

Nowadays the topic is still being studied and developed, by such architects and researchers as Juhani Pallasmaa (2013), Peter Zumthor (2006), or Jan Gehl (2011), to name just a few, and the non-visual qualities of architecture and space seem to re-gain their importance in the field of planning and urban design. Unfortunately the contemporary city spaces are deprived from the sensory stimulation (Sennett, 1994; Pallasmaa, 1996; Landry, 2006; Urbanowicz 2013), and suffer from 'placelessness' (Arefi, 1999). The architects and urban planners search for solutions to increase the quality of the spaces and they try to specify the "assemblages of distinctive place features" (Green, 2010) as the parameters that influence their ephemeral, non-visual, difficult to describe character of the space and their unique identities.

Jacek Dominiczak together with Monika Zawadzka and Agnieshka Kiera developed the concept of the Local Identity and Design Code as a tool of urban conservation. It's based on The Source (Identity) Code, which "is urban architecture-specific,contextual and numerical as it uses geometry to define urban identity and prototype of a particular area" (Kiera, 2011). According to the authors it describes all elements that form urban identity, such as the city plan, streetscapes, urban interiors, scale and façades. Despite the interesting and innovative aspect of the concept, it is still strongly

related to the physical, material or measurable aspects of the space identity. In the group research the idea was to create the Design Code, that "provides a specific and objectively contextual set of guidelines and defines the scope for compatible infill development" (Kiera 2011), but basing on different set of parameters, that the identity, or 'sense of place' consists of. The group interpretation was more alike with the definition by Raymond James Green: "The notion of 'sense of place', which is closely related to the idea of place character, refers to an individual's experience of a place as conveyed by distinctive features and meanings associated with the place that gives it a unique identity" (Green, 2010), and the collected data and information from the urban context was highly subjective and personal, as a prototype of a real study, to be developed into a participative tool, to collect a representative database of immeasurable impressions and experiences that together with the physical urban context create the unique identity of the place.

The data from the space, especially the subjective and unmeasurable aspects, were deeply investigated through empirical space explorations. As Rick Joy (2012) stated, "One can gain a sense of place only from taking the time to become intimately immersed in its particular natural characteristics – the very qualities that make it unique at a broad range of scales, [...]". Deriving from the 'strollology', the walk as a tool to construct a conscious experience of a place became the main issue in the space exploration process. "Psychogeographical practices of exploration are additionally feeding into, and resonating with, wider current concerns with rethinking cities and urban space. The attention to mood, ambience and the possibilities of the urban are proving conducive for those seeking to develop critical understandings of urban experience and life" (Pinder, 2005). The group's site survey was focused on gathering the qualitative data and subjective information, with maps, notes, descriptions, photo documentation as well as sound recordings and movies. The quality of this impressions was valued and immediately transformed into a quantitative system of data, which would later serve as the 'Source Code' for further analysis for an objective Design Code to be developed.

Due to time limitation related with the workshop duration, the collected subjective information was representing the impressions of very few students – group members, serving as an experimental way, which could be practiced in the future with a wider group of observers. The approach could be developed and implemented to survey the opinions of a representative group of professionals, locals, tourists, and other actors of the space. The crucial issue would be the experience of the real space and collection of these experiences through an organized method. The group designed a proposal for a mobile application, that could serve as a tool to reach a wider audience and systematize the subjective information for the further research. There is an undisputable necessity of a larger pool of subjective data and a larger group of data collectors, but with the aid of such an application, it would be possible to create a quite complex and reliable database to then create a super matrix to allow a multi-layered referenced elaboration of data.

2. FRAMING IDENTITIES / DATA ORGANIZATION

This part was the very core of the study, devoted to craft the parameters as a number of specific items originated from the first categories used to articulate the coastal identity (Narrative/Objective/Physical). In particular this step was essential to investigate and visualize the role of parameters in the definition of the district identity.

A set of diagrams has been drafted to investigate the very nature of the single parameters and their interconnection with the environmental categories they are affected by. Some of these diagrams were conceived to represent the variation of parameters as it was detected during the explorative walks (path diagrams that somehow were resembling a linear section through a specific district). The practice of walk in this case proved to be essential to detect a big amount of silent, hidden

features embedded in the districts, and by this point of view the path diagrams fit also to display the particular relationship between parameters and walk path. Radar charts were then used to display the behaviours of parameters in relation to a class of variables. This type of diagrams work pretty to give a clear and effective idea of the variations/fluctuations of the parameters in specific districts.

In order to represent and investigate at large the relationships between the whole group of parameters and different classes of impact, all the data have been organized within a matrix. The aim of this matrix was intended to represent on a single table the interdependency between the single parameters and a number of variables: e.g. environmental elements (architecture, use of space, spatial planning, senses, nature, people). Eventually the association between a single parameter and one of the environmental elements has been evaluated assigning an indication of value (strong, medium, weak).

As a conclusion or summary for this part a very complex and articulated causal diagram has been produced to represent the levels of interconnection between the different parameters and their specific role in the definition of the identity.

The interesting side of this part of the work stems from the "representation effect" which is activated essentially by the very nature of these diagrams. Diagrams are not just graphic tools to organize somehow a pool of data. They could work on a more sophisticated level and serve as instruments to decipher a complex web of relationships within the population of data.

3. RE-ARTICULATING IDENTITIES / FROM IDENTITIES TO DESIGN CODES

This last part was conceived to test different strategies of visualization able to propel the transition of the parameters from indexes of identity to markers for new developments. In this attempt a specific design code, crafted to refer to a specific design scenario, has been assigned to each set of data. For the concept and the application of design codes, this research referred to the work of Agnieshka Kiera (Kiera, 2011), although in her study the local identity sources for the codes are represented by quantitative data (mainly physical/geometrical features of buildings), while in this case qualitative data have been used as identity sources.

As a result, the multi-identity character of the context of reference, re-interpreted and re-articulated in this way served as an operative tool to address future urban practices (the method would display how specific spatial identity nodes may be activated, reinforced, or even reduced accordingly), and it may suggest how the districts may be spatially re-articulated into new configurations. Eventually, the ultimate database that this method implies, displays how the different districts may be transformed into an urban laboratory to test and produce future visions.

A different class of diagrams and visualization strategies has been adopted in this last step. No longer to represent a particular behaviour of a parameter but to imply, to suggest, to evoke its role to produce a change. By this point of view diagrams are used as operative devices to re-articulate identities into design codes. Therefore they are not a passive device but an instrument able to address a transformation. Different authors focused on the operative nature of diagrams, in particular Antony Vidler emphasized their crucial function of "pointing" (Vidler, 2001: 85), Gilles Deleuze conceived them in terms of abstract machines able to produce reality (Deleuze, 1988: 34), and R. E. Somol defined them as a means of proposing a world other than that which exists (Somol, 1999: 24). These attempts eventually disclose how diagrams possess projective and performative qualities more than simple representational. This concept assumed a fundamental role as a guiding principle for the experimental character of this study.

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MEASURING THE IMMEASURABLE. RE-ARTICULATION OF BALTIC COASTAL DISTRICTS' IDENTITIES - FROM PERCEPTION TO PRACTICE THE CASE OF THE NORTHERN URBAN EDGE OF GDANSK

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Keywords: place identity, qualitative and quantitative data, data visualization, design code

1. INTRODUCTION

How do different urban identities and environmental characters articulate and what is the spatial result of this articulation?

What creates the character/ atmosphere/ sense of place? How to identify and measure the importance of these elements?

How to define the different identities of places and how to relate to the multi-identity of the chosen area of the city in the future development scenarios?

How to incorporate into a study elements that may be collected only subjectively? How to detect them and more important how to organize them within a consistent system that allows their interpretation?

Are qualitative data able to support a study? If yes then, what kind of approach, process of analysis may fit them?

How to turn the identity parameters into markers addressing future development on the local or even regional scale?

1.1. GOAL OF THE RESEARCH

The built environment conveys a lot of information about the identity of a place. This message is hidden in the streets, behind the facades, in general in all the elements that form the urban texture, yet it is also embedded in human behaviour. The knowledge that derives may tell not only about the past and the present conditions, but also allows to address and to guide possible future developments. Therefore the design practice may benefit from an extensive study aiming to investigate the hidden, silent components of the built environment, that may be related with its either physical or intangible qualities. In particular analytical observations and collecting of data, serve as a valuable source of information and an important tool in designer's hands.

The aim of this research was to construct an experimental framework to prove the following

hypothesis: the environmental sources of the identity of a place may be turned into effective indicators to point future prospects in terms of both planning and daily use. The group proposed an experimental approach based on subjective survey activities to search for parameters that create the unique atmosphere of a place and contribute to the coastal identities of the districts of the northern urban edge of Gdansk. The goal was to test the role played by spatial identities as catalyst to empower different future scenarios, first by finding and measuring the subjective impressions and perceptions of the places and then by visualizing this set of qualitative data into a quantitative reference system. Eventually the soft intangible data from the districts was re-articulated into Design Code, which would serve as guidelines for different possible future scenarios for the districts according to their identities.

1.2. PLACE IDENTITY - THEORY BACKGROUND

The term "place-identity" exists in scientific discourse since the late 1970s (Proshansky, 1978). The very first study on place identity has been conducted by Harold Proshansky, Abbe Fabian, and Robert Kaminoff, where they defined it as the individual's incorporation of place into the larger concept of self (Proshansky, Fabian & Kaminoff, 1983). In general the authors state that identity is formed in relation to environment and consists of knowledge and feelings developed through the everyday experience of physical spaces. The idea of place identity then is complex and difficult to frame in one exhaustive definition. How the authors emphasized it is a "potpourri of memories, conceptions, interpretations, ideas, and related feelings about specific physical settings" (1983: p. 60). For this reason the study of place-identity implies the integration of different fields of research, from urban planning and architecture, to geography, psychology, and urban sociology. The concept of place-identity itself is characterized by a nuance of distinct factors (tangible and intangible, objective and subjective, architectural and psychological) that complement each other. A full picture of the identity of a place then originates from the mutual relationships among these diverse components.

Starting from this study other contributions were developed inside the field of environmental psychology and social theory (Breakwell, 1986; Hummon, 1992; Twigger-Ross & Uzzell, 1996). All these authors agree that the sense of identity of a place originates from the process of identifying the people's experience in it, and from the consequent emotional bond established between people and places. Hence the emphasis of their discourses is on factors that are external and independent to the nature of place.

Another line of research emcompasses approaches that focus on the concept of "character" of a place as determined by physical elements inherent within itself (Cullen, 1961; Conzen, 1966). The idea of the character of a place has been further elaborated by Christian Norberg-Schulz in terms of "*genius loci*" (Norberg-Schulz, 1980). *Genius loci* represents the meaning people attribute to a place as the result of a sum of physical and symbolical values in nature and human environment. Norberg-Schulz seeks the essence of place in qualities that are place-intrinsic. Although Norberg-Schulz promoted his study as step towards a phenomenology of architecture, it has been Edward Relph who produced one of the first works opposing the physical point of view and focusing on a phenomenology of the place. In particular he attempts to reconsider the person-environment relationship and stresses the experiential bonds that people establish with place (Relph, 1976).

Even though Relph recognized the importance of both tangible and intangible factors as necessary to experience the physical aspect of the space (e.g. pragmatic space) and the intangible aspect (e.g. abstract space), yet the discourse on place-identity evolved along these two opposed trajectories, endorsing either physical or symbolic traits of space.

Today a specific attention is paid to contemplate the emotional tie that relates people to places. In particular people's identity with the place was already central in Relph's discourse, who framed it with "the concept of insideness - the degree of attachment, involvement, and concern that a person or group has for a particular place" (Hubbard, Kitchin and Valentine, 2008: 45). Theories stressing the importance of aspects of atmosphere, individual perception, a collection of sensory experiences that create peculiar spirit of the place are more and more popular among contemporary architects and urban planners. According to Mirko Zardini (Zardini, 2006), "sensory revolution" in the architectural and urban context appeared as a rediscovery of specific character of a place. The character assigned to the particular space shows its specificity which is not limited to visual aspects. It includes a variety of sensory impressions for the place. Assessment of the environment is a complex process involving many senses. It affects countless intertwining factors that together translate into the overall atmosphere, feeling, mood or atmosphere. (Pallasmaa, 2013). Jan Gehl (2011) stressed many times in his publications, that a feeling of space quality occurs when factors such as: "life in space, climate and architectural quality" work together and complement each other, creating a "lasting impression of entirety". According to Gehl, the result is a feeling of physical and psychological well-being: a sense that space is in every respect a place pleasant and worth it to stay in it.

1.3. EXISTING RESEARCH METHODS CONCERNING PLACE IDENTITY

Given the complexity of the topic and the wide variety of identity definitions, there is no surprise that existing research concerning space identity represent a diversity of approaches. Research basing on the early concepts of genius loci and those that are more inclined to support the view that the identity of the space is articulated by the physical realm tend to use objective research methods such as literature research, surveys, documentary photography. The data collected is therefore usually quantitative, for example a direct evaluation of the physical features of buildings such as proportions on the basis of a survey activity. The quantitative data, collected through counting and statistics, objective answers from the surveys, documentary photography and measuring can be the result itself or stand as the background for other activities. This research approach originates from objective research methods based on the assumption that "*an objective reality exists independently of the observer. Knowledge should be acquired through 'dispassionate' and 'objective' observations, in which the researcher interferes as little as possible with the subject"* (Sattrup, 2012: 6).

An alternative approach could be based on the assumption that the reality is a mere construct of the observer's mind, which is characteristic for constructivists in opposition to traditional scientific paradigm. Favouring such approach could lead to preference for subjective research methods, collecting (usually qualitative) data based mainly on sensory observation, impression and overall feeling of particular phenomena. In case of unstructured interviews, narrative investigations, field observations and similar, a researcher places himself as a measuring instrument. Due to phenomenological perspective, the data is influenced by personal experience, bias, perception interferences and even prejudice to particular situations, areas or elements. It could be argued that such approach "decreases the statistical significance of the data but lending a deeper more nuanced understanding to what is under study" (Schwartz, 2013). Subjective research decreases the meaning of objective statistic elements as peripheral, thus it could be easily connected to those theories of space identity that focus on human experience. These theories, usually more complex and multidimensional, call for experimental methods of research, focusing on the intangible factors described by qualitative data.

Lack of unified definition of identity of a place resulting in a wide variety of approaches and many experiments in this field of study can be illustrated by diverse examples of research conducted by Jacek Dominiczak, Sharilyn Niedhardt, Wilfred Hou Je Bek, Lucius Burckhardt and many more.

Dominiczak in his work shows the important role of the physical dimension of the urban fabric and he proves, that it is possible to read a place identity through the physical structure of the district. According to him, the shape of the architecture and urban grid tells about the history, way of life and culture of the inhabitants of the place. Local Identity and Design Code concept developed with Monika Zawadzka and Agnieshka Kiera (2011) focuses on a detailed analysis of geometry (dimensions, angles, proportions etc.) as the parameters of place structure and identity. The Code is closely related to a theoretical line which recognizes the characteristics of cities as not limited to theirs aesthetic and physical qualities, and in particular originates from the discourse of Kevin Lynch who emphasizes the role of the visual sense for the comprehension of the built environment (Lynch, 1960) and from the proxemics theory of Edward Hall who states that the perception of space is a cultural construction (Hall, 1966). A characteristic urban structure may be perceived as the physical manifestation of the anthropological and social identity, history and culture.

Completely different line of research promotes a quite experimental approach characterized by the idea that space can be understood and investigated only through a subjective engagement supported by unconventional means of exploration. The beginnings of this line may be traced back to the experimental activity known as Psychogeography formalized by Guy Debord in 1955. He defines it as '*the study of the precise laws and specific effects of the geographical environment on the emotions and behaviour of individuals*' (Debord, 1981: p. 5). The work of Debord and other Situationists has been extensively investigated by Simon Sadler (Sadler, 1999) and David Pinder (Pinder, 2005b) who offer a wide picture of the urban dimension of their practices and experimental methods still inspiring today for subjective based researches. Sadler points out how these methods allowed them to conceive the urban space as constituted by "*soft, mutable elements: the play of presence and absence, of light and sound, of human activity…*" (Sadler, 1999: 70). Their effort to construct new visions of the city is also emphasized by Pinder who notices how "*they sought to investigate and change urban spaces through new forms of geographical research and action*" (Pinder, 2005b: 128). Later Lucius Burckhardt, although from a different perspective and with different aims, founded a new science named Strollology (the study of strolling) which *"[...] examines the sequences in which a person perceives his surroundings"* (Burckhardt, 2012: 239). Burckhardt identifies the act of strolling as the necessary condition that enable us to understand how the perception of the natural and built environment is constructed. Thus he observes that the "*landscape is to be found not in the nature of things but in our mind's eye*" (Burckhardt, 2015a: 19) Another significant value of the subjective fashion of strolling is that it allows a deep awareness of the displacement evoked today by our environment: *"[…] our generation is the first to find itself in a novel situation vis-à-vis the object observed, be it a building or a landscape. And the explanation is once again strollological. It is not objects themselves that have changed, but the context"* (Burckhardt, 2012: 245). Eventually the legacy of both Situationist practices and Burckhardt's discourse constitutes a valid reference for any experimental method of research based on critical walks and subjective modes of mapping and representing the multilayered nature of place identity.

1.4. OUR APPROACH

1.4.1. THE GAP IN THEORETICAL RESEARCH

Looking at the identity research methods mentioned in the paragraphs 1.3.1 and 1.3.2, one cannot help but wonder whether all of the existing methods can be treated as examples of one of the two main approaches to the problem. These two ways can be illustrated by previously mentioned characteristic examples of dr Dominiczak's Local Identity Code and described in David Pinder's "Arts of Urban Explorations".

The result of dr Dominiczak's research, the Source Code, is "*urban architecture-specific, contextual and numerical as it uses geometry to define urban identity and prototype of a particular area. It describes all urban identity forming elements, from the city plan (grid of the streets, distribution of public spaces, urban 'grain'), through the key streetscapes (urban interiors) to individual features of the city architecture (scale, façades)*" (Kiera 2011, p. 5). It clearly represents the first approach - one that can be perceived as rigid, focused on numbers, dimensions and raw data. The theoretical research in this group is usually well structured, complex and detailed. The key factor characteristic for this approach is what Agnieshka Kiera notices and describes in regards to Design code as "*objective arithmetic precision with which it defines the compatibility of new infill development with the existing urban context.*" (Kiera 2011, p. 7)

On the other hand there is the second approach that seems to antagonise this way of thinking and conducting research. Focusing on a subjective impressions and experiences, these researchers (though sometimes more appropriate term would be artists, explorers, activists etc.) explore the soft factors, certain sociopolitical aspects of space, relations between different parameters. In the example of urban explorations "through street art and other interventions, its members seek to exploit opportunities for play and subversion as they interact with the city's spaces" (Pinder 2005a, p. 385). This approach is more human-centered although, often due to its subjectivity, it turns out to be researcher-centered.

Our team noticed the gap in the theoretical research between those two approaches. While the first one simplifies the meaning of identity, neglecting many important intangible factors, the second seems to have a wider view on the identity but lacks structure in research, quantification of the factors and precision. There is no method that would take into account both tangible and intangible factors as well as the look at the matters from both subjective and objective points of view. The aim of this paper is to create the base for developing the third kind of approach. One that would be a holistic, yet structured, and would try to measure and interpret factors that are usually considered immeasurable in order to raise their importance in the design process. An approach that would fill the gap in the theoretical research between two antagonising points of view.

1.4.2. FILLING THE GAP

Seeing the need for a new approach in identity research, we faced a question of how to fill the gap. The newly developed approach is an attempt to derive from both of the previously described approaches - to gather the soft, immersive data without much intervention into the space, to interpret the intangible data in a structured way that would make them countable and to translate them into a design code but without excessive simplification. We found and measured the subjective impressions and perceptions of the places and visualised this set of qualitative data to re-articulate it into design codes - different possible future scenarios for the districts according to their identities. As a result, a structured approach, divided into 3 phases, each consisting of 2 steps was developed.

The aim of the first phase *Exploring identities* is data collection through traditional approach

Fig. 1. Methodology framework diagram
Source: own construction

of literature research, critical walking method based on the work of situationists and mobile application proposal aiming at minimizing the researcher influence on the data collected. During this phase we investigated multi-layered spatial identities in order to designate which parameters support a specific identity of the district. The second step was focused on the interpretation and organization of data in a double track fashion: with several diagrams, data mapping and with a systematic "catalogue" – a matrix, that translated the qualitative information collected in the field into an organized quantitative data base.

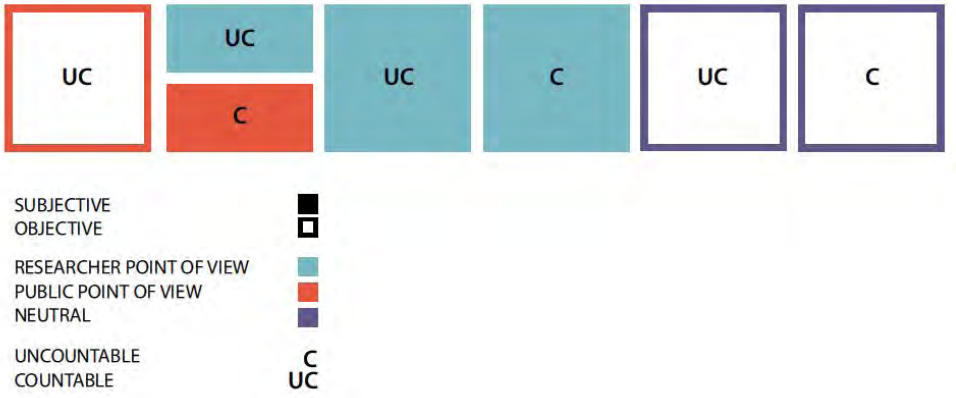


Fig. 2. Work rules diagram
Source: own construction

The last, the most challenging phase, concerning the shift from identities into design codes, was focused on testing an operative tool to address future urban practices. This experimental approach displays which specific spatial identity nodes may be activated, reinforced, or even reduced accordingly, to suggest how the districts may be spatially re-articulated into new configurations to fit better a specific design scenario for the future development.

The work rules followed during all stages are illustrated on the Diagram 2:
The approach incorporates both subjective and objective data, as well as collects the data from both researchers' and public point of view. For each phase the first step is dealing with the data in still uncountable form - drawings, diagrams and lists, only in the second step the same data is measured in numbers. The second step of each phase is measuring the immeasurable, therefore making it easier to draw conclusions from intangible data. It simplifies very complex concepts and needs to be accompanied by the first step to avoid omissions.

1.4.3. POSSIBLE BENEFITS & BENEFICIARIES

Having concluded the gap in the research methodology concerning measuring identity of a place and our intent to fill it, there is a need to mention the possible benefits of developing the approach proposed in this paper. Possible beneficiaries include the ones mentioned in the diagram X but does not limit to them.

In general, local identity research is a tool that can help architects and urban planners in the design process, as well as local authorities and investors to take decisions regarding development strategy for the city. By analysing various identity parameters that are considered "immeasurable" the approach allows them to take into account previously neglected aspects and thus take more informed decisions. However other groups - such as inhabitants, tourists or local guides - can also benefit from both taking part in gathering data for the research and analysing the results.

The participatory aspect of the research - which allows inhabitants to be one of the biggest beneficiaries - is the advantage of the mobile application proposal. This part of the described method focuses on implementing business approach into scientific research - something that is not widely practised but gives new perspectives, especially when it comes to scope and funding of the research. This kind of app could simultaneously gather data from the users and provide them with other unique selling point such as: serving as a search engine for routes based on mood or atmosphere, social platform, participatory design tool or trip journal. This approach provides new benefits out of local identity research. Different ways, in which various groups of stakeholders could benefit from such mobile application, are described in the chapter 3.1.2.2.

Fig. 3. Possible beneficiaries of the research
Source: own construction

2. LOCATION

2.1. GDAŃSK AS AN AGGLOMERATION WITHIN A POLYCENTRIC SYSTEM OF TRICITY

2.1.1. OVERVIEW

Tricity is a flagship coastal agglomeration in Poland. It consists of three core cities Gdansk (pop. 460k), Gdynia (pop. 250k) and Sopot (pop. 37k) and a number of smaller ones. Tricity is located in the northern part of Poland in the region called Pomerania, famous of it's direct coastal location, which provides a number of attractive factors both for inhabitants and tourists.

Relatively linear castline location, which forms a characteristic polycentric conurbation is the most peculiar feature of Tricity. The cities are connected by the main road and the railway system. Each city has it's own centre and Gdansk is slowly developing sub-centres apart from the historical Main Town. The whole agglomeration is working in a polycentric, yet synergic way. Not only because of the population but also from the metropolitan point of view, Gdansk (with the area of 262 km^2) plays the most important role in the region. It is the headquarters for voivodeship and regional authorities, as well as a number of metropolitan functions, like courts, opera, philharmonic hall, great museums etc.

2.1.2. DISTRICTS AS A SYSTEM OF DIFFERENCES

The spatial structure of the city is highly diversified. Most of the districts were villages before, but due to expansion of the city, they were adopted and absorbed to the city boundaries. As a result Gdańsk consists of both historical parts, like Main Town, Old Town, Nowy Port (harbour), Oliwa (Cistercian monastery), Brzeźno and Jelitkowo (leisure zones), Wrzeszcz. On the other hand there is a number of newer districts, developed after the WWII, when Poland suffered a serious housing shortage problems. Those are mainly Przymorze, Zaspa and Żabianka which were built in the sixties and seventies and are mostly residential zones. What is typical for those districts is the type of buildings which are made of the concrete large slab. Those urban developments introduced completely new way of thinking, very different from the typical historical, dense urban fabric concept.

The neighbourhoods are mostly divided by the road network. They are recognised thanks or due to the clear architectural differences. Having in mind the context of historical development of the city of Gdansk, it can be said that the neighbourhoods were developed quite separately and joined during the time. Hence they formed their own separate identities which are quite clearly visible at first sight. As a result Gdansk has developed a mosaic of diverse neighbourhoods, with clear boundaries and characters, with a common denominator which is coastal location.

So what actually defines the coastal identity and how is it articulated by so different city districts? During the research we decided to take into account five different areas: Brzeźno, Jelitkowo, Nowy Port, Przymorze and Żabianka. Having in mind their rather significant differences (in living satisfaction, affluency, architecture, history) we tried to discover in what way those neighbourhoods commonly express the coastal identity and character, both themselves and of the whole city of Gdansk.

2.2. DISTRICTS' CHARACTERISTICS

2.2.1. ŻABIANKA, PRZYMORZE

The newest districts among the studied scope come from the 2nd half of the 20th century. After the war the great housing crisis occurred, and those districts were a response to that need. The authorities were looking for a cheap and quick way of building residential areas. Thanks to the new technology of prefabrication, such undertaking was possible. The government was also looking for building something modern following the Athens Chart stating new rules of urban and architectural design. The modernist movement's ideas are clearly visible in this architecture, but were not fully developed due to the economical issues. Poland also was under the communist government, and such architecture had to resemble and articulate socialistic ideas of social equity and equality. As a result, large residential housing areas were built very quickly. They had to be affordable, and so they are until today.

Unfortunately they are built in a monotonous way. Large blocks are relatively over-scaled. The distances between them are quite big. The whole areas seem to be neglected and underdeveloped. Yet the inhabitants are ones of the most satisfied people in the whole city. There is a lot of green areas, more facilities and amenities are constantly appearing. One of the greatest assets is the Reagan's Park, which creates a certain kind of buffer between the built area and natural zone, making this part of coast more pleasant. The park plays a significant role in the whole metropolitan area as a leisure zone.

Moreover, this is the most populated area in the city, which is facing two major demographic problems. On one hand it is the depopulation issue. People are moving to suburban areas, where they tend to have their own house and car. On the other hand is the ageing issue, which is very dangerous, having in mind that these districts accommodate the majority of the city population.

2.2.2. JELITKOWO

The character of this small neighbourhood is historically defined by its leisure and recreation profile. It is not a separate district, but a northern part of the greater area Żabianka-Wejhera-Jelitkowo-Tysiąclecia. Houses in Jelitkowo are quite expensive. There are also new developments sometimes located in the park, but as it is a gated community it is very moot whether this area should be developed this way. Majority of the urban fabric consists of multi-family villas, partly functioning as hotels or rooms for rent. There is a number of historical buildings as well, e.g. old spa house (currently 'Parkowa' restaurant) and fishing houses from 18-19th century.

The connection to the water is very clear. The area is located just over the coast and covered with vegetation. It has a very pleasant feeling. Thanks to that, more tourists are seen during the season, the space looks more interesting. A number of events are held regularly, like dancing parties, live music in the restaurants etc.

2.2.3. BRZEŹNO

Brzeźno is also famous for its leisure and recreation character. It is a larger district than Jelitkowo. The most famous landmark in this district is the long walking pier, which is one of the main coastal attractions in this area, underlining the direct. Historical villas from the 19th century are also a great asset in this area, which enhances the coastal and unique character of the district. Moreover, there are old fishermen's houses and sanatorium facilities (also historical). Those kinds of buildings bring

up the truly coastal identity of the place in a leisure and health context.

Similarly to Jelitkowo, live music and fish restaurants can be found there, they are mostly active during the tourist season. The beach and direct, public access to the water is an advantage comparing to the other districts like Nowy Port, Przymorze and Żabianka. This makes Brzeźno attractive not just for the local inhabitants but also for the tourists. The whole area is focused mainly on the touristic industry and in the future, more health and rehabilitation amenities are planned to be developed (reserved in a zoning plan).

2.2.4. NOWY PORT

The historical harbour district (18th century) seems to be a phenomenon among other Gdansk districts. This is due to the specific kind of separation from the other urban fabric. Nowy Port was historically built as a port and up to this day it functions this way. But it was a separate village. What is striking, is that during the history it maintained this odd character and still does not border directly with other districts. Being in Nowy port makes one feel like in a smaller city.

Despite being over the river, the access to the water is rather blocked by the harbour facilities (magazines, etc). The only connection is rather visual, because of the regular fabric. Moreover there are ships that can be seen from the streets, and along with the sounds of birds and boats, the whole area still feels like coastal.

The collected information can be organised in a form of table. Such organisation of data enables easy comparison with the data collected during the research of objective parameters. Thanks to that research it is possible to observe the changes in physical elements of the districts. Further studies could also determine which elements of the present morphological structure of the district have historical background. Moreover it could define those areas that need to be exactly analysed during further subjective data research.

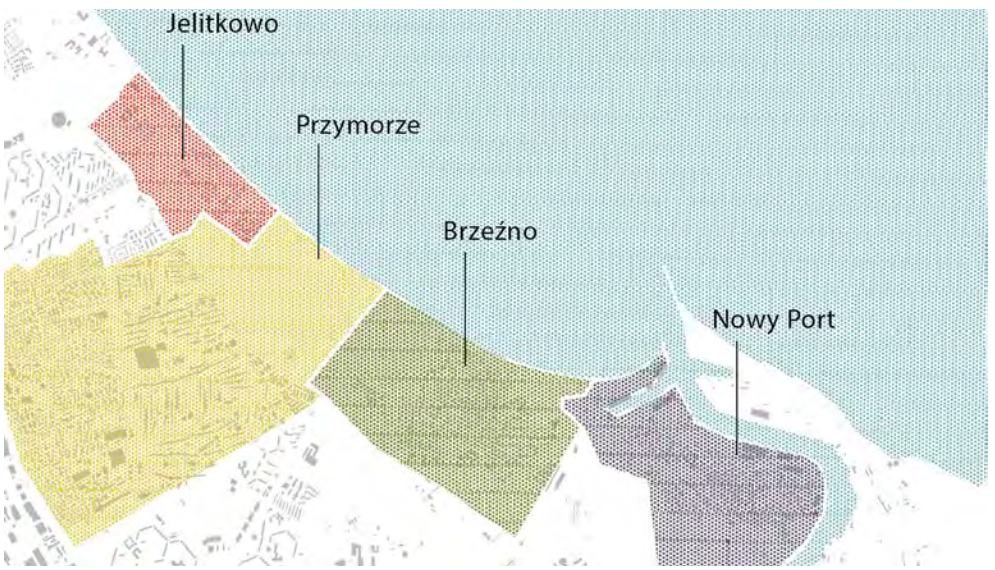


Fig. 4. Map of the studied districts
Source: own construction

3. THE STRUCTURE OF THE RESEARCH

3.1. EXPLORING IDENTITIES / DATA COLLECTION

The first of the three phases of the study, Exploring identities, focuses on investigating multi-layered spatial identities. It is an attempt of answering a very first and basic question - what is the identity of researched places? We were looking for a strategy to explore and understand identities of the districts of northern edge of Gdansk. This first phase consists of two steps - collecting respectively objective and subjective data. Only after having a clear view on what exactly is the characteristic identity of these places, we can study how is this specific identity articulated in the next phase of the study.

3.1.1. OBJECTIVE DATA COLLECTION

The first few weeks were devoted to collect both historical and actual information about the chosen districts, framing the context of the districts through literature studies, web research and field explorations. Starting with collecting easily obtained and clear objective data allowed to create a base for exploring the space and its intangible, immeasurable identity articulations. Exemplary objective parameters which occurred were : height of the buildings, age of the buildings, monuments, type of the buildings, type of used materials, documentary photographs.

HEIGHT OF THE BUILDINGS	**MEASUREMENTS**
AGE OF THE BUILDINGS	**DOCUMENTARY**
TYPE OF THE BUILDINGS	**REGISTRATIONS**
TYPE OF USED MATERIALS	**REGISTRATIONS**
DOCUMENTARY PHOTOGRAPHS	**DOCUMENTARY PHOTOGRAPHS**

Table 1. Matching parameters to the objective research methods
Source: own construction

Starting with the literature research, we analysed historical and contemporary books mentioning the districts, guides, official websites, forums and newspaper articles. For this purpose a key for categorization of data was developed beforehand with 14 categories describing either coastal or citylife identity. The categories listed for coastal identity were: visual connection to the sea, multi-sensory evaluation, people's responses, psychological perception, architecture, canals and local traces(cultural references). The data concerning district's citylife identity were to be assigned to one of these categories: public spaces, services, citizens, psychological comfort of being in the space, morphology, public transport, social life of the community, tourism, safety, art, semi-private spaces, architecture, green spaces, local narratives. The data gathered in this part was structured into brief descriptions. The summary of content analysis of newspaper articles, that appeared on official website of Brzeźno district (www.brzezno.trojmiasto.pl, 2016), may serve as an example:

According to the news articles coastal identity is a very important part of Brzeźno's identity to such extent that one could say that it is in fact dominant. Areas nearest to the sea are considered the most valuable asset of the district and described as a treasure, which is reflected in the price of the plots. The most important factor mentioned as a cause for this situation is possibility of daily walks to the seacoast (for potential inhabitants). Recorded people's responses confirm that many citizens of the area visit the Brzeźno's beach frequently and that one of the most common reason is the proximity of the beach. The beach is also main reason for tourism in the area. The coastal identity is also carried by architecture e.g. canals

as an element of landscape architecture for restricted habitat. According to the articles the specific identity of the district is conveyed in the cameral atmosphere, which other districts like Zaspa or Przymorze lack. Psychological comfort of being in the space is described as high. Articles describe various parts of social life of Brzeźno's community such as sand sculpture exhibition, bicycle trips or public consultations. The events seem to be connected to one of the three closely related parameters: coastal identity, specific atmosphere or the history of the district. Described art exhibition of sand sculptures also refers to the identity of Gdańsk as a city in form of lion sculptures (symbols of Gdańsk).

As it is clearly visible in the example above there are many traces of subjective data gathered in the literature research - descriptions of people's perceptions of the districts. However, it is the objective data that is the most important in this stage. *Table 1* lists the physical objects that were mentioned in the literature as the important factors for the identity of the districts. This list served as a preparatory step for field explorations.

Objective architectural parameters distinguished during the literature research can be compared with the examples that were collected during the field explorations (*Table 2*). Counting and

"legendary" buildings/Wiking	Nowy Port
historic Churches/district centres	
skyline monuments/lighthouse-Falowiec-Churches-lighthpuse-cranes	
harbour channel	
old rows of the trees	
historical physical separation from Gdańsk	
district designed following rules of Athene Charter	Przymorze
Park Przymorze (historic park)	
Socialist dogmas - districts of social equity and equality	
The district of young people	Żabianka
High percentage of green area among space usage	
Original decorations and installations design by local artists	
old spa house	Jelitkowo
old fishing houses XVIII/XIX	
old villas from XIX	Brzeźno
pier	
former settlement of local fishermen	
during interwar era - popular healt resort	

Table 2. Literature research
Source: own construction

describing the height of the buildings by writing down number of its storeys, which was done during the field exploration, can be compared to the measurements done to create dr Dominiczak's *Source Code* (Kiera, 2011). Another realized activity was notation of the dates using historical documentary registration.

All the objective data gathered in a was structured into descriptions and visualised by photographs and finally organized within a venn diagram. Mapping the most important objective parameters on a venn diagram allowed first organisation of the objective data collected by dividing them into three categories: narrative, physical and atmospheric.

Falowiec	Nowy Port
South blocks	
Up to 3 storey buildings in center	
The dominating size is length	Przymorze
All buildings are very long but vary in height (up to 11 storeys)	
New buildings are tower-shaped (18 storeys)	
Small pavilions among the residential blocks	
Malls are low and wide	
Shops, pavillions, markets near the promenade (up to 2 storeys)	Żabianka
Block of flats (10 storeys)	
School, kindergarden	
Big hotels - to 4 storeys, large areas (Mercure, "Rzemieślnik")	Jelitkowo
big hotel - 8 storeys, large area (Novotel Gdańsk Marina)	
New apartments - up to 3 storeys	
Villas, detached houses	
Small old fishing houses - 1-2 storeys	
Small house-garden (allotment gardens)	
Small seasonal bars and shops	
Up to 5 storey blocks	Brzeźno
Single houses	
Small pavillions among the residential blocks	
Malls are low and wide	
old spa house	Jelitkowo
old fishing houses XVIII/XIX	
old villas from XIX	Brzeźno
pier	

Table 3. Field exploration
Source: own construction

3.1.2. SUBJECTIVE DATA COLLECTION

After preparing a base for research through literature studies and mapping objective data, the next step of the proposed approach is to focus on the subjective factors. This introduces the main idea of the described research - an attempt to catch and describe the intangible identity of a place. Subjective impressions are bound to a person experiencing them - that is why this step of the research was done from two points of view. In the first part the data collected is a description of district identity as perceived by a researcher. In the second part a tool was developed - one that allows to gather data from various amount of people. While describing identity of a place through

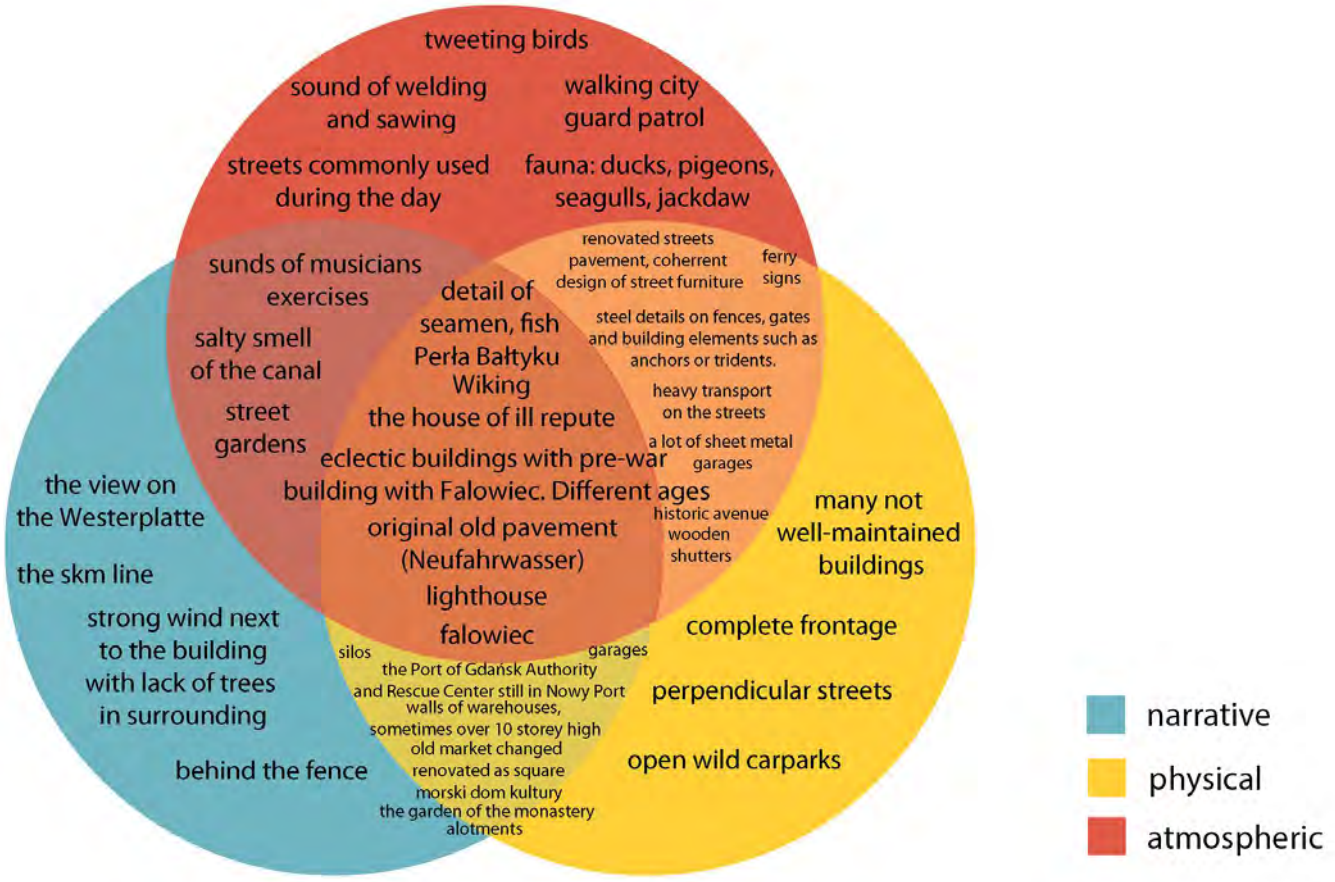


Fig. 5. Objective factors for Nowy Port field exploration
Source: own construction

public point of view is a huge step towards democratisation of identity research and accuracy of the results, the process of gathering data from many people requires simplification of the study, narrowing down the scope and assessing the strength of certain parameters without context. Consequently, both steps featuring different points of view complement each other and neither of them alone is sufficient for fully describing the identity of a place.

In case of subjective data it was very important to create self bordering scope of parameters which we were focused on. Parameters which were referring not only to ideas drawn from literature mentioned before, but also to specific characteristics identified in our districts. It means that parameters such as coastal smells, sound and views, compared to presence of the people on the streets, their usage of space and overall atmosphere brought unique values in each case. Subjective perspective of the participant had a strong influence of the results, which was perceived as an additional value bringing us closer to point of view of our theoretical future receivers.

The aim of the study and the criteria we set for the categorization of data, required a subjective method to collect data based on direct observations and personal engagement with the places to be investigated. Subjective gathering of data is a method deeply influenced by the perspective of the observer, by his/her mind set, cultural background, experiences, therefore the result is multifaceted,

yet this is a necessary condition to really understand how the interpretation of the natural and built environment is constructed. Supported by these ideas we set on the gathering of immeasurable, qualitative data by means of strolls, critical walks and tours inside the districts.

This particular approach allowed us to collect previously categorized information in the most direct way from a point of view similar to the one of a citizen, a tourist or any pedestrian. The very fundamental point was the human scale derived by this kind of direct observation. We saw, heard, felt and perceived what inhabitant could noticed but also focused our sense, minds and observations on the specific parameters. Eventually we repeated our strolls several times since the set of subjective parameters under construction was constantly changing and evolving.

3.1.2.1. FROM RESEARCHER'S POINT OF VIEW

To collect data from the researcher point of view we needed a strategy to question and investigate the urban territory. Among different ways of exploring the urban realm, no matters whether a number of districts, buildings or even open-air areas, critical walking is one of the most effective and engaging methods to grant a human scale perspective. Walking through a space is indeed the most basic act of self-engaging in the surroundings and actually the one we are used to perform every day. Yet it is necessary to conduct the walk in a conscious and critical fashion, in order to turn it into a tool to investigate and question the reality.

This kind of critical exploration within the urban space originates from the subversive set of practices developed by the Situationists in late 1950s. They performed extensive aimless walks through entire sectors of Paris to radically question the nature of the modern city. This activity was conceptualized in terms of "drift" by Guy Debord (Debord, 1981: 50-54). The drift assumed an open ideological and political stance. As Simon Sadler notices the drift became a transgression of the alienated world, and at the same time enabled a revolutionary perception of the city (Sadler, 1999: 94). This study of course does not have any aim to rescue the ideological side of this practice, yet embraces with enthusiasm some aspects of the Situationists' discourse which advocates unconventional way of exploration: from the production of maps to challenge the average street map, to the invitation to feel abroad even when at home.

The approach of this study is closer to the work of Lucius Burckhardt, the founder of the science of strollology. Strollology (or the science of promenade) examines the sequences in which a person perceives his surroundings during a walk aiming to disclose aesthetic aspects of the environment (Burckhardt, 2012: 239). Basically is a scientific method Burckhardt constructed to investigate the process of knowledge and accumulation of information experienced while moving through space (Burckhardt, 2015b: 31).

Critical walking has been performed by the means of a series of individual walks through particular district. During the walks a wide range gathering of data was pursued trusting all senses, then with the aid of maps and diagrams those data has been formalized. The walks have been performed along south to north paths, from the border of a district towards the sea. The aim of the walk was to explore the space focusing on subjective perception, constantly documenting personal feelings, impressions, thoughts and intuitions with photos, videos, sketches and notes. The walks performed were repeated at different dates, varied times of the day following numerous tracks. Walking down the various streets of Gdansk's districts allowed us to understand and formalise a subjective perception of districts' identities. In the last stage these subjective perceptions were visualized in a series of maps and diagrams as the following samples illustrate.

1. MENTAL MAP

Mental Map is a map of subjective perception of a district drawn from the memory after critical walking. It features symbols for these elements, behaviors, feels and structures, that left the biggest imprint in the memory of the subject, interested and intrigued the researcher the most. It is an effect of long strolls, which gave us idea, but not coherent information about neighbourhood.

2. MOODBOARD

The Moodboard Map consists of a several photos taken during the critical walking composed on a cadastral map background. The chosen photos are supposed to transfer the subjective impression of the place - they depict the most characteristic and attention grabbing factors for a specific area. The size and placement of the photo shows the area that it is characteristic for. As a result, the mash-up of photos conveys the feeling and subjective perception of the district in a direct way with a regard to the localisation of the parameters and their importance.

3. LABELS MAP

The Labels Map is created from watchwords representing impressions of the stroller. They are not divided in scale or importance but place, where they were most significant. This map represent visitor or even inhabitant associations with the district. The idea is to show the receiver elements noticed by researchers, later by all beholders, in clear, direct and organized way, still basing on subjective impressions about the importance of specific factors.

3.1.2.2. FROM ANYBODY'S POINT OF VIEW - MYMAPS TOOL

As researchers, we focused our minds on this specific beholding and searched for its implementation possibilities in the subjective methods. This is reflected in using the critical walking method - which allows to document a wide range of subjective impressions giving a full view of the identity of a place. This method though is only effective for collecting the data from researcher's point of view and representing it in an uncountable way. Thus, we have divided our point of view into two main sections which consider interest, experience and theoretical background of the recipient. This gave us more scientific approach for researchers' perspective and more direct and resilient for regular user allowing collection of data from anybody's point of view. This second part collecting subjective data may be treated as an extension for a critical walking method, as well as simplification and attempt to quantify the uncountable, intangible parameters.

Comparing the elements mentioned in the literature, we have created way of gathering immeasurable information, which required to use tools adjusted to our needs. The data that we were interested in could not be collected from the base operating on measurable information, like the population, bandwidth of the streets or a reference to the age of the residents. Seeking appropriate resources we came across Google MyMaps that among many options was the most effective and showed further development prospect to our approach.

MyMaps, a web application produced by the Google company allows to create custom maps that are referred to the parameters established by the author and can be shared, multi created or spread in the web. In our case, maps relied on the parameters more difficult to determine such as use of space, pleasure of being in the place or safety. Their properties, including the scale of value have been defined herein before by the team, and tried and tested in the manner of critical walking and specified as a most suitable for our research.

Teams responsible for the specific districts conducted walks during which the collection of requested information had a place. Information and factors such as the smell of the sea, the

Fig. 6. Mental Map, Nowy Port
Source: own construction

Fig. 7. Mental Map, Brzeźno
Source: own construction

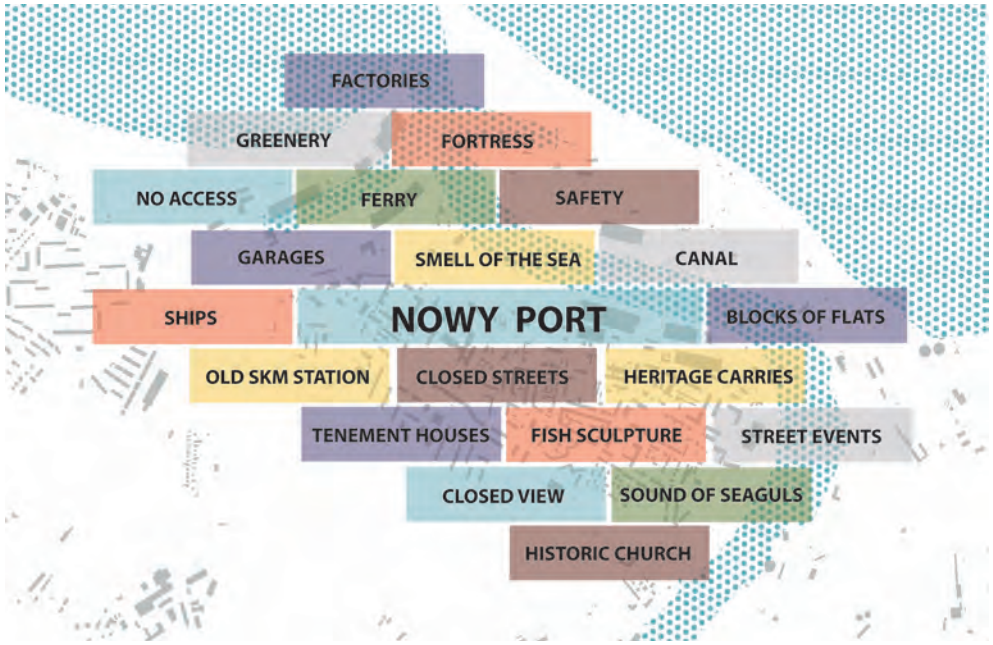


Fig. 8. Labels Map, Nowy Port
Source: own construction

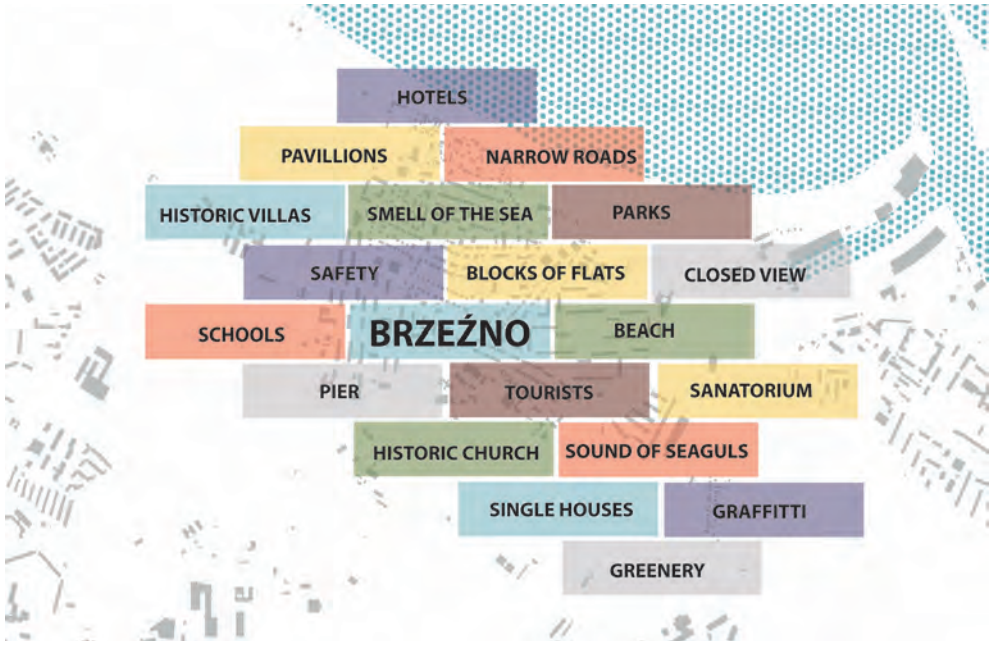


Fig. 9. Labels Map, Brzeźno
Source: own construction

Fig. 10. Moodboard Map, Brzeźno
Source: own construction

quality of architecture, the cleanliness of public spaces, the presence of people on the streets, etc. were described either with words or using assumed scale of value. Each of this parameters was determined first on paper, including the point or route on the map to which it refers, backed by notes, photographs, description of impressions, sometimes written directly in MyMaps application. The main issues preventing introduction of the data directly to the application were an Internet connection quality, mobile application's usability and the complexity of the parameters.

The collected data was presented on the cadastral map grid, in the form of points and pathways describing and documenting the experience of the researchers. In a similar way walks were carried out and described by Julius Burckhardt (Burckhardt, 2012), with main difference in the prewalk approach, which assumed pre analyzing assumptions and parameters describing the districts. This approach helped us to avoid ineffective ideas such as idea of determining district connection to the mountain in the flat coastal areas. Therefore, noticing multitude of the opportunities and time limits, it was more efficient to work according to earlier created restrictions.

While the drawings and diagrams following the critical walking method present more holistic and complex description of a district's identity, this second simplified step using MyMaps tool is actually quantifying the intangible, immeasurable information. Therefore the two steps complete each other and both are necessary for all-encompassing approach to studying a district's identity. The inaccuracy of field explorations with MyMaps tool is certainly their biggest disadvantage (one cannot even compare the unstructured multi-sensory evaluation of a safety during critical walking to this out-of-context assessment on a scale from -5 to 5), however this simplification is paradoxically their biggest advantage as well. Assessment of the parameters on a predefined scale not only simplifies

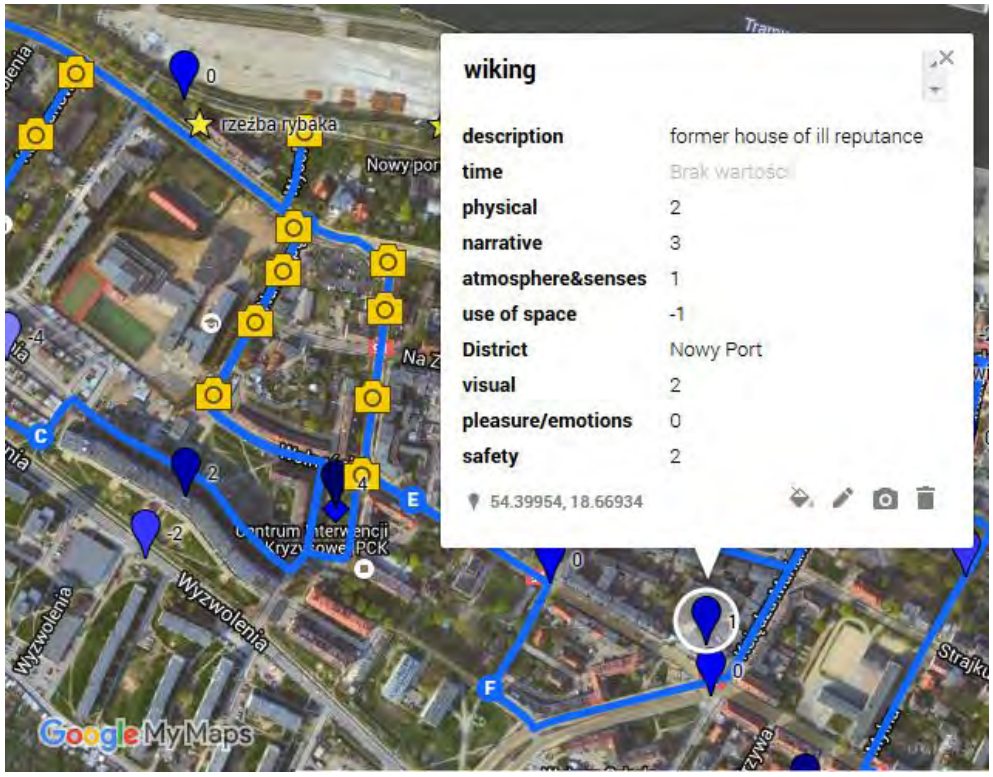


Fig. 11. Collecting data in Nowy Port using MyMaps application
Source: Map data: Google, 2016, DigitalGlobe

the process of organisation and interpretation of the data, but also enables anybody to collect the data. Thus, creates a potential to gather data from many points of view and most importantly by users of the space, regular passers by, inhabitants and tourists. Of course in case of large scale research the MyMaps tool would not be sufficient as it's rather a prototype of a solution. Therefore, the idea of custom application for collecting and presenting data in form of maps and charts is described in the next chapter as a possible public and widespread solution.

3.1.2.3. FROM PUBLIC POINT OF VIEW - MOBILE APPLICATION PROPOSAL

Continuing the idea of quantifying the intangible, subjective parameters, constituting on the identity of a district, on a numeric scale, a draft of mobile application was developed. This tool could transform the immeasurable insight into quantitative data. Creating such application would enable researchers to collect coherent data from large amount of people, thus studying the identity of a space as perceived by locals. This idea is meant to contradict the usual scheme of collecting data either from the point of view of a researcher or with his intervention into the space, as we noticed that even the human-centered urban explorations (Pinder, 2005a) focused on pedestrian's behaviour were usually affected by researcher's actions. A mobile application would facilitate the process of data collection, making it possible to gather insight without a researcher on the site. The general aim of this approach is democratization of the research process.
The functionality of the mobile application would include gathering, organising, analyzing, visualizing, filtering, sharing and maintaining data.

GATHERING
Gathering data would take place in every occasion when user had a moment and will to fulfill elements in the application. They would have a chance to create points and further paths described by: evaluation of suggested parameters, photos, text, films, sounds records and geographical location. In easy way, with one tap, user would automatically mark their location and have a chance to evaluate suggested parameters on a scale. Additional options could include adding custom suggestion. The suggestion would have to be discussed by researchers before possible implementation.

SHARING
Application connected to social media would give the user opportunity to share their experience and impressions. To compare beholdings, suggest interesting points or make propositions of improvement for a place. Those options refer to the single package of information gathered from one point and one person at a time.

ORGANISING
Data organisation would be the most important at the beginning, not only for the management team, but also for future users and stakeholders. This would require a schemes of data separation, for example how close points dedicated by user should be to be counted as one or which elements should be showed together, how to storage them, how easily bring them back from our storage, how to keep them clear and accessible.

VISUALISING
Well organized data described as factors would be connected with interactive diagrams, maps, sets, matrixes and others, which would process information and change graphics at real time. This pattern would give us opportunity to create as many visual effects as many evaluated parameters we would get.
ANALYSING

Fig. 12-13. Application design (samples)
Source: own construction

Fig. 14-16. Application design (samples)
Source: own construction

Visualisation of data would be a tool to get the interest of the users, to make application clear in usage and attractive, but also to help us analyze this massive amount of information. Parameters collected in diagrams constructed, similarly to those designed by our team in this research, would give an additional value by showing dependents and interconnections between specific parameters. The diagrams could show how the parameters influence the area and what we can do to keep some of the high, increase or decrease their value. In simple way the application would apply our approach to wider spectrum of data.

FILTERING

By more data we will get more information which may interest more stakeholders. Proper data organization and separation of specific parameters in and out of the application will increase the chance to find a direct way to specific receivers. Various stakeholders would have a chance to use the data in the conditions described by us and base their actions and plans in the area on our conclusions.

MAINTAINING

Maintaining the data would be constant process. Owners would be obligated to take into account participants suggestions, implement them or reject. Our work in this topics, as a whole application process, would require cooperation and involvement of other specialists. Only this extended team could organize, clean and rearticulate the parameters, data and conclusions and create coherent participatory tool.

While collecting data is the most important feature of a proposed tool from a researcher's point of view, the selling point of such application could be entirely different. It could be assumed that the application could work just as a participatory tool in the design process, that users motivation for using the application would be the opportunity to help local community and authorities to increase the value of the place and to define local identities. However, it could be argued that having another feature acting as a main benefit for the user, would increase the popularity and effectiveness of the application. For example the application could serve as a search engine for routes based on mood or atmosphere. It could be a tool for saving and sharing your trips and travels or even some kind of a lifestyle map. Many possible functionalities according to various stakeholders are represented on diagrams below.

3.2. FRAMING IDENTITIES / DATA ORGANISATION

Having collected various data concerning identity of Gdańsk's districts in the first phase of the research, we had formulated a certain view on character of each district. The identities of the districts were represented on drawings, diagrams and maps created in the first phase. The next step is to understand how are these identities articulated. Organising different kinds and types of data requires specific approach. Juxtaposing subjective and objective elements of different nature, in a way that they intersect with each other was achieved by creating a specific matrix. Having in mind the very complex character of the identity, it is crucial to understand the way it works. The constructed matrix organises and frames the information in a specific and rational way, so the basic properties are more comprehensible. Understanding the gathered information is necessary to form proper design codes for future development. Therefore the better the gathered information is organised, the more appropriate and implementable codes can be developed.

3.2.1. THE MATRIX

The matrix that was created is a table, where the explored elements are put together so the mutual

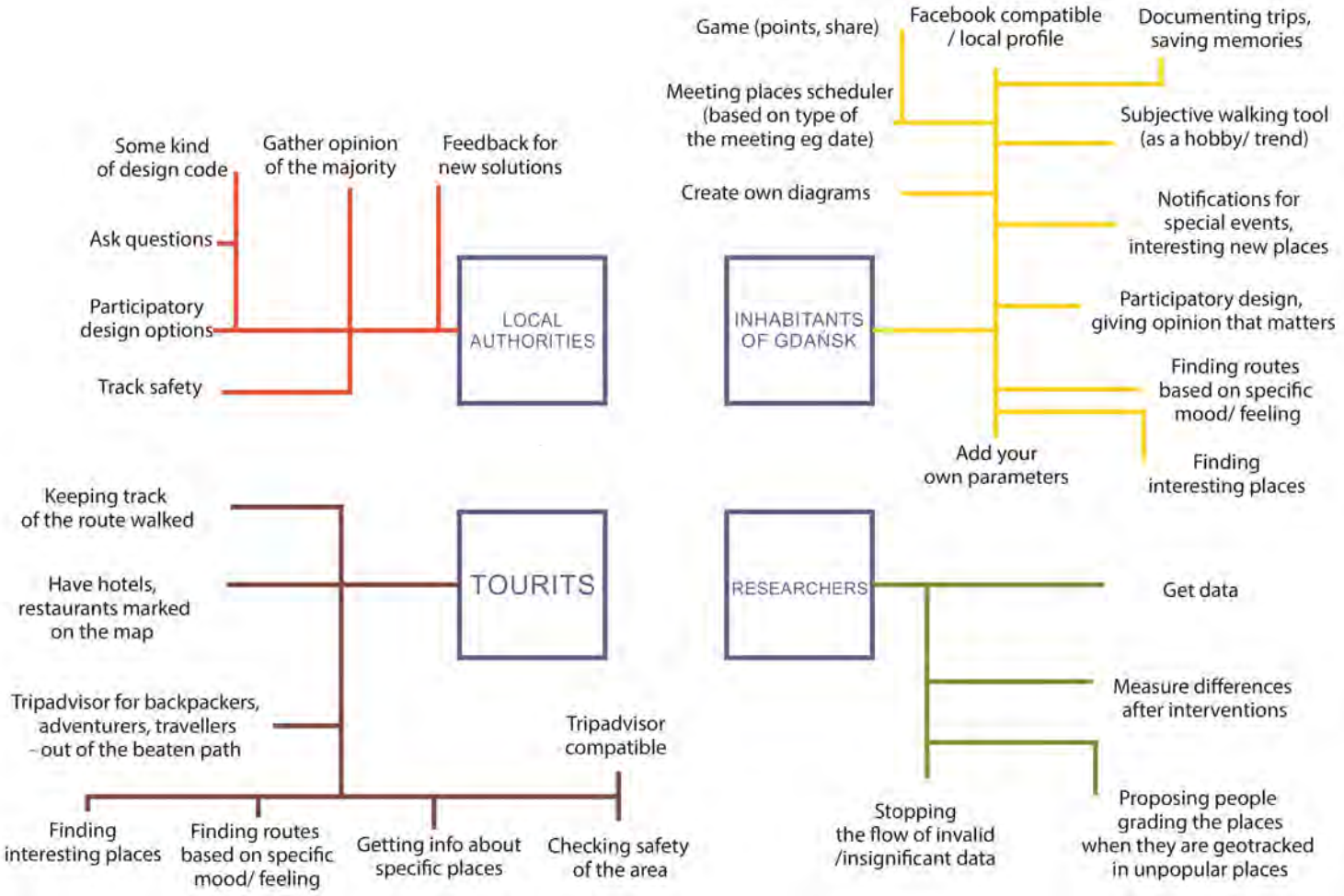


Fig. 17. Possible uses of the application for different beneficiaries
Source: own construction

relation can be indicated, read and named. The components in the columns correspond with those put in rows. The cell at the point of intersection is a place, where the attribute of the connection is placed and named. This property can vary according to the matrix's purpose. It can indicate either the strength or type of influence as well as define the connection.

The advantage of such approach is the possibility to read the causality of each parameter. Therefore it creates a more readable and digestible way of compiling the causal relations between the given elements. This was achieved by deconstructing the subjective and objective elements and grouping them in categories, parameters and sub-parameters with respect to the districts, in which each sub-parameters are represented. Each sub-parameter, an identity building factor in one district, is represented by a row. The columns represent classes of impact - through which the identity can be articulated. There are four classes in the matrix: architecture, use of space, planning, senses, people. First one represents the existing buildings and urban fabric within the given area. Second one represents the way the space is being used in general. Third one shows the future of the space. The fourth one expresses the type of sensual experience that accompanies the space perception. The last one is the human factor - how the classes of impact are influenced by the given sub-parameters.

Then, the relation between sub-parameters and the classes of impact is easily readable at the intersection of a row and a column. Third feature of the matrix was created by adding the strength layer. Each of the sub-parameters are graded with this factor to indicate the level of influence represented by colour. This is to indicate the value and specify the behaviour of each sub-parameter in relation to the given class of impact.

There are four main categories in the matrix: Narrative, Physical, Atmosphere, Social. Each of them groups different type of parameters and sub-parameters. The first category is about the narrative values of the space. These are more subjective, sensational and sometimes rather personal e.g.:

- art (which may appear under atmosphere of place or physical properties according to the focus);
- special places;
- local stories and narratives.

The second one is strictly material and mostly quantitative, rather objective and unarguable. This is what we can see and judge by our visual impressions, or what we can measure with dimensions, e.g.:

- architectural: form, materials and textures, details;
- urban: shape, scale and morphology;
- sections of the spaces: may include street outlines, skylines, variation of density, massing and voids;
- special functions and buildings;
- public spaces;
- urban furniture: form, materials and details;
- transportation and accessibility;
- vegetation: quantity, species, types of green surfaces (natural, cultivated, planted, semi-artificial);
- physical connection to the sea.

The third category is Atmosphere. This is another type of subjective and sensational impressions, but rather referring to senses and safety. These are mainly:

- sounds: e.g. seagulls, sounds of the sea, bells, music;
- sounds from the harbour;
- noise;
- smells;
- materials, textures as a multi-sensory experience;
- wind;
- sun, shadow;
- water (canals);
- latent, hidden views;
- visual connection to the sea and non-visual connections.

The last category is Social. We indicated there parameters which refer to:

- people;
- communities;
- tourists;
- locals;
- number and age of people;
- street life;
- space hierarchy (private, semi-private, public).

In each of the categories there are some example parameters. Additional questions serve as help in filling the matrix. Once it is filled with the parameters, the sub-parameters are proposed. In contrary to the rather generic character of the parameters, these are specific examples existing in the given space, like a church, sound of the seagulls etc. They represent the last stage of the spatial specification.

Once this is done, the behaviour must be assessed. In the following matrix, the behavioural features are already proposed. They indicate in what way the specified sub-parameters influence the given classes of impact. Once this is defined, the last stage of filling the matrix has to be done, which is the influence strength. There are three levels of grading the impact: strong, medium and weak - represented by the color code, based on the simple intensification. Together with the behavioural feature, they represent most accurately the correlation between the parameters and the space. With the whole matrix filled, reading the performance of the space becomes more feasible. Yet this matrix serves not only to visualize and organise the pool of data, in fact it is the indirect step towards the articulation of design codes.

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
1		*amount of significant monuments*	monuments		
2	1			"legendary" buildings/Wiking	Nowy Port
3	0			historic Churches/district centres	
4	1			skyline monuments/lighthouse-Falowiec-Churches-lighthpuse-cranes	
5	0			"Falowce" (subjectively) - ridiculously long buildings	Przymorze
6	1			Park Przymorze (historic park)	
7	0			Church dedicated to Our Lady of Fatima	Żabianka
8	1			Żabianka SKM	
9	1			old spa house	Jelitkowo
10	1			old fishing houses XVIII/XIX	
11	0			old villas from XIX	Brzeźno
12	1			pier	
13	0	*are there any signs of art and performance?*	art in public		
14	1			Fisherman Sculpture	Nowy Port
15	1			Fish Sculpture	
16	0			Ceramic sculpture	Żabianka
17	1			Blue ceramic low relief	
18	0			Low relief on the wall of block of flats	
19	0			live music	Jelitkowo
20	0			live music during the holiday season	Brzeźno
21	0			graffitti	

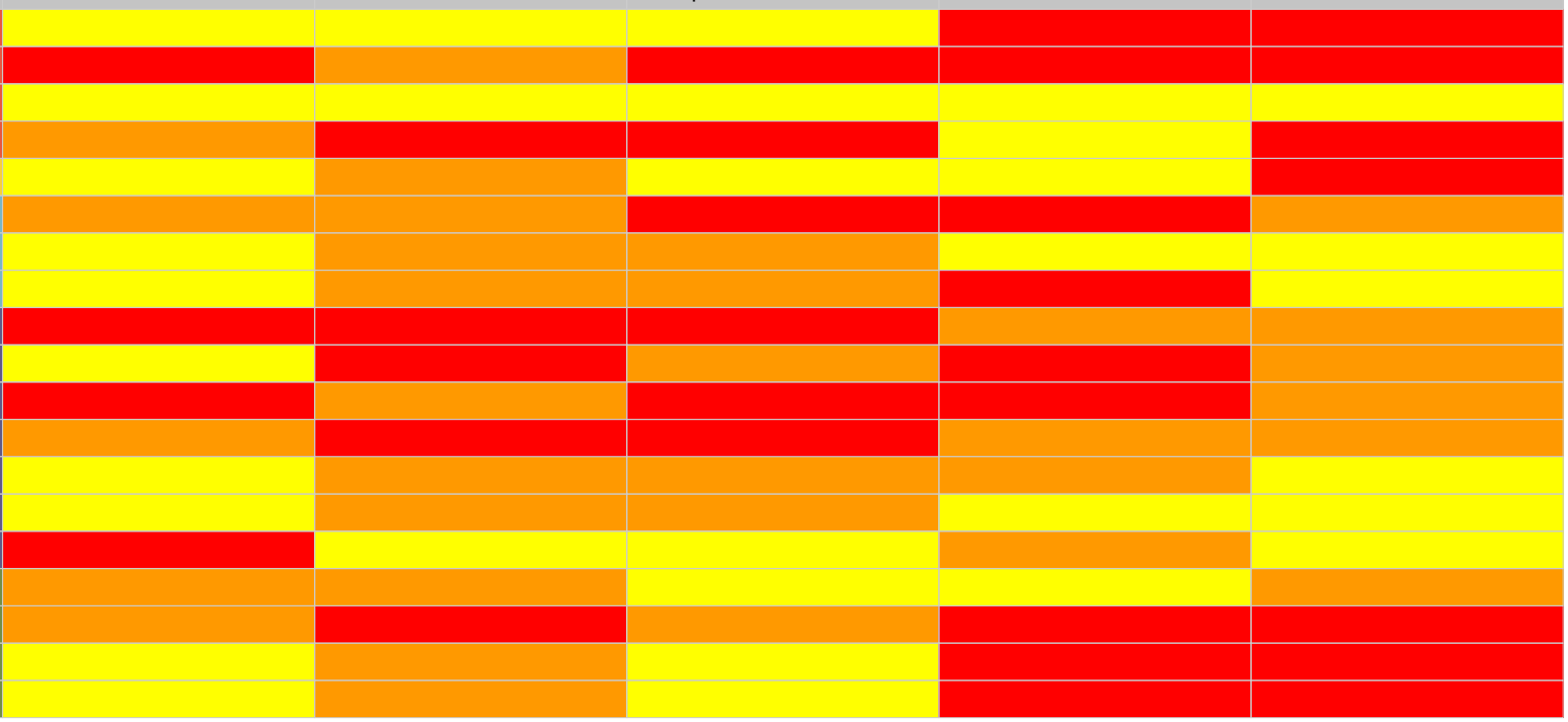
Table 4 - Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
focus points	**authenticity centrality**	**anchor points**	**visual identyfication of place**	**attract gather interest**
new dimension	create the functions variety in functions	tool for planning	perceiving valorization and identification	perceiving valorization and identification

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
22	0	*are there any places of significant meaning to the locals?*	special places		
23	0			Garage City	Nowy Port
24	0			Meeting points /Renowated main square, pedestrians streets	
25	0			Old SKM station	
26	0			Heritage Carriers - Łaźnia	
27	0			Klub Osiedlowy "Piastuś" - community house	Przymorze
28	1			Promenade	Żabianka
29	1			Fountain- out of service	
30	0			Park near the church	
31	1			old spa house (restaurant "Parkowa")	Jelitkowo
32	1			park	
33	0			church	
34	1			main entrance to the beach (sqare with the fountain)	
35	0			the tram loop	
36	0			bus stop	
37	1			hotel Mercure	
38	0			hotel Lival	Brzeźno
39	1			Park Zdrojowy	
40	0			Zespół Szkół Ogólnokształcących	
41	0			st. Antonio Church and kindergarten	

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
diversyfing	character	anchor points focus points	focusing points of interest	predispose interest and concentrate



1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
42	1	*any specific history that accompanies the area?*	history		
43	1			Nature of harbour district	Nowy Port
44	1			Names of streets connected with harbour	
45	1			Plants brought on ships	
46	0			Completely new approach to architecture and urban design	Przymorze
47	0			Post-war housing shortage crisis	
48	0			1986? - gas explosion in Falowiec on Piastowska street	
49	0			1991 - British Princess Anna visits a typical family in Falowiec	
50	0			Open-air workshops "Ceramic for architecture", Edward Roguszczak	Żabianka
51	0			"Osiedle Młodych" Cooperative, arch. Roman Hordyński	
52	0			Significant amount of playgrounds for children	
53	0			Old spa district	Jelitkowo
54	1			fishing district, Kashubians (XV century)	
55	1			pier (nonexistent) , cruise ships	
56	1			old fishermen's houses	Brzeźno
57	1			old sanatorium's buildings	
58	1	*does the architecture resemble any kind of maritime theme (details, materials, form)?*	maritime design/arch.	maritime furniture	
59	1			Urban Furniture details/Anchors in front of buildings, Gates detail	Nowy Port
60	1			Architecture Details/	
61	1			The blocks ("Falowce") are supposed to resemble the transatlantic ships going towards the sea	Przymorze
62	1			The name "Falowce" comes from the word "fale" ("waves") - which the waving shape are supposed to imitate	
63	1			Blue ceramic low relief- shape of the wave	Żabianka
64	1			Name and icon of the kindergarden "Dolphin"	
65	1			Small fishing houses (traditional architecture)	Jelitkowo
66	1			Old resorts architecture	
67	1			fence in the waveform (hotel Mercure)	
68	1			small wooden bars/shops	
69	1			Small fishermen's houses (traditional architecture)	Brzeźno

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
roots, memory, cultural heritage	predefine the fuction layers of time	background historical references	identification with patterns/periods	predispose settle i surrounding

give the context	character/public	context reference elements	marine directed perception	leads to impression of coast

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
70		*are the buildings large or small?*	scale of buildings		
71	0			Falowiec	Nowy Port
72	0			South blocks	
73	0			Up to 3 storey buildings in center	
74	0			The dominating size is length	Przymorze
75	0			All buildings are very long but vary in height (up to 11 storeys)	
76	0			New buildings are tower-shaped (18 storeys)	
77	0			Small pavilions among the residential blocks	
78	0			Malls are low and wide	
79	0			Shops, pavillions, markets near the promenade (up to 2 storeys)	Żabianka
80	0			Block of flats (10 storeys)	
81	0			School, kindergarden	
82	0			Big hotels - to 4 storeys, large areas (Mercure, "Rzemieślnik")	Jelitkowo
83	0			big hotel - 8 storeys, large area (Novotel Gdańsk Marina)	
84	0			New apartments - up to 3 storeys	
85	0			Villas, detached houses	
86	1			Small old fishing houses - 1-2 storeys	
87	0			Small house-garden (allotment gardens)	
88	1			Small seasonal bars and shops	
89	0			Up to 5 storey blocks	Brzeźno
90	0			Single houses	
91	0			Small pavillions among the residential blocks	
92	0			Malls are low and wide	

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
perception/density	distribution of functions	context	border them or spread	perception

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
93		*is the section wide or narrow?*	scale of streets		
94	0			State Road	Nowy Port
95	0			Narrow paved streets - perpendicular to canal	
96	1			Streets pararell to canal	
97	0			Large distance between the buildings - wide sections	Przymorze
98	1			Promenade	Żabianka
99	0			Paved streets	
100	0			Paths	
101	0			Pomorska - dual carriageway	Jelitkowo
102	0			Kapliczna / Piastowska - main streets	
103	1			small internal roads	
104	1			walk way driving to the beach	
105	1			promenade	
106	0			small internal roads	Brzeźno
107		*is the district close to the shore or is it away? is the water integrated into the district?*	water closeness/presence		
108	1			Fenced harbour	Nowy Port
109	1			Open East coast	
110	0			Distanced and separated from the water by large park	Przymorze
111	0			A pond in Park Przymorze	
112	0			Few ponds in R. Reagan Park	
113	1			Potok Oliwski/Jelitkowski - a stream crossing few ponds	
114	1			Potok Oliwski/Jelitkowski - a stream crossing few ponds	Żabianka
115	0			Fountain- out of service	
116	1			Beach as a part of a district	Jelitkowo
117	1			network of streets communicated with the beach	
118	1			Beach as an important part of a district	Brzeźno
119	1			long wide streets creating the anticipation of the sea	

Table 4. Matrix of the parameters
Source: own construction

classes of impact

architecture	use of space	planning	senses	people
urban morphology	intensity/ interaction/ vitality	programming	border them or spread	regulating flow and comfort
authenticity/ character of place	maritime but also simply water based	context	coastal feel	calming, stimulating and attracting

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
120		*what kind of greenery is present in the district?*	vegetation		
121	0			Starodrzew	Nowy Port
122	1			Starting point for new plants brought on ships	
123	1			Forbiden Forest vis a vis Wisłoujście	
124	1			R. Reagan Park	Przymorze
125	0			Randomly placed vegetation around the district (modernistic urban design manner)	
126	0			Lots of trees	
127	0			Park near the church (pine trees)	Żabianka
128	0			Vegetation between the blocks of flats (grass, hedges)	
129	0			Vegetation neer the playgrounds (grass)	
130	0			Trees near the streets and paths (deciduous trees, hedges)	
131	0			Allotment gardens (near Oliwski Stream)	
132	0			Haffner Park	Brzeźno
133	1			Reagan's Park	
134	1			Park Jelitkowski	Jelitkowo
135	1			R. Reagan Park	
136	0			Trees near the streets and paths (deciduous trees)	
137	0			Allotment gardens	

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
as previous one	opportunity of diversification	tool for planning	influence overall perception of place	calming, stimulating and attracting

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
138			*services*		
139	1			Port of Gdańsk board	Nowy Port
140	1			Border Guards	
141	0			local services - Health Center	
142	0			local servisec along pedestrian oriented street	
143	0			City services / Higher school of safety	
144	0			Quite a few education faciliteis (schools, kindergartens)	Przymorze
145	0			Health-care facilities	
146	0			Leisure centres	
147	0			Police station	
148	0			SKM Station	Żabianka
149	0			Supermarkets, small shops, market pavilion	
150	0			Local sevices along promenade	
151	0			School, kindergarden	
152	0			Sport club	
153	0			Hotels / apartments	Jelitkowo
154	1			Restaurants / bars	
155	0			Hotels / apartments	Brzeźno
156	0			School/kindergarten	
157	0			Lidl, Biedronka	
158	0			old Supermarket with ice cream shop	

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
interaction	support	background	stimulating	predispose

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
159		*typology and quality, materials used, facades?*	*architecture*		
160	0			Blocks of flats	Nowy Port
161	0			Tenement houses	
162	1			Falowiec	
163	0			Brick structures	
164	0			Decorated facades	
165	0			Affordable housing, mainly obsolete large blocks of flats	Przymorze
166	0			Low diversified architecture	
167	0			Mostly concrete, mortar and paint - low quality architecture	
168	0			Some new buildings offer higher quality of design	
169	0			Blocks of flats- blocks of concrete slabs, insulated walls	Żabianka
170	0			Buildings of services- low quality, variety of facades and details	
171	0			Churches- modern architecture, bright facades	
172	0			sloping roofs	Jelitkowo
173	0			detached houses - cube houses	
174	0			big hotels - modernistic blocks	
175	0			brick architecture	
176	0			single, simple houses with a flat roofs	Brzeźno
177	0			semi-detached communist houses	
178	0			old tenement houses - low quality architecture	
179	0			blocks of flats - low quality architecture	
180		*can one feel any smells resembling the sea or water?*	*maritime smells*		
181	1			Strong sea water smell in north and east	Nowy Port
182	0			No maritime smells	Przymorze
183	1			Fish shop in the market pavilion	Żabianka
184	1			Smell of the sea and park	Jelitkowo
185	1			In the park and old fishermen's area	Brzeźno

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
context	background	framing	visual	giving character of the place
n/a	character of space	maritime atmosphere	smell	giving character to the place

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
186		*can one hear sounds of sea or water e.g. machines, sea birds, ships?*	*maritime sounds*		
187	1			Talks about shipyard	Nowy Port
188	1			Sounds of seaguls	
189	1			Sounds of ships	
190	1			Maritime sounds only in R. Reagan Park	Przymorze
191	1			Sounds and view of seabirds	Żabianka
192	1			Birds	Jelitkowo
193	1			hubbub of tourists	
194	1			closer - the sound of the sea	
195	1			Birds	Brzeźno
196	1			closer - the sound of the sea	
197		*does one feel safe in the specified space?*	*safety factor*		
198	0			Not safe after nightfall	Nowy Port
199	0			Rather safe for locals	Przymorze
200	0			"Foreigners" may not feel safe due to lack of night-life	
201	0			Rather safe	Żabianka
202	0			Unpleasantly only near the liquor shop, allotments during the night	
203	0			Safe	Jelitkowo
204	0			not safe after nightfall	Brzeźno
281			*tourism*		
282	0			Little influence of tourism	Nowy Port
283	1			Tourists hardly visible and recognisable	Przymorze
284	0			No tourists' services, souvenirs etc	
285	0			No tourists' services, flats for rent only(summer time)	Żabianka
286	1			dominant function of the area	Jelitkowo
287	1			Hotels and apartments for tourists, many of the during the holiday	Brzeźno

classes of impact

architecture	use of space	planning	senses	people
enriching perception	attracting specific functions	giving local character	acoustic	help to localise sea
visual connections	defing type of function	programming/warning	calm/make anxious	influance on peoples flow
character of place, authenticity, attraction	attracting specific functions	potential/functioning	loudness/acoustic	predispose

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
216		*does one feel to be in the urban, suburban or rural neighbourhood?*	*urban feeling*		
217	0			Relatively regular streets grid	Nowy Port
218	1			Streets perpendicular to canal	
219	0			The feeling is not very urban due to low density yet not suburban too	Przymorze
220	1			Near block of flats, promenade	Żabianka
221	0			Allotment gardens	
222	0			holiday resort	Jelitkowo
223	0			far from city traffic	
224	1			main part of the beach for toursits during the holiday	Brzeźno
225	0			separated mini-districts of blocks	
226			*presence of the vacant spaces*		
227	0			Open abadoned landfill	Nowy Port
228	0			Vacant space inside the district	
229	0			The vacant spaces are present because of the modernistic manner of urban design - some of them are being developed	Przymorze
230	0			Vacant spaces filled with low quality greenery	Żabianka
231	0			parks (renovated), attractive space	Jelitkowo
232	0			Messy and kitschy main square, promenade (shops, bars, suvenirs)	
233	0			lot of greenery	
234	0			Vacant spaces filled with low quality greenery	Brzeźno

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
visual connection - uniqueness	defing type of function	defining density	visual/sounds	predispose
maritime atmosphere	discourage specific functions	opportunities for new development	calm/make anxious	unattractive/undermine "public character" of space

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
235		*are the streets and other spaces rather crowded or empty?*	*number of people passing by*		
236	0			High number on market streets	Nowy Port
237	0			Empty side streets	
238	0			The main streets are full of cars, some people are passing by	Przymorze
239	0			The inner streets (or main pathways) are moderately crowded in the midday	
240	0			Some spaces between the buildings are too empty	
241	0			Main streets, promenade- crowded	Żabianka
242	0			Recreation space- medium crowd	
243	0			Space between the buildings- empty	
244	1			Promenade - crowded	Jelitkowo
245	1			Recreation space- medium crowd	
246	0			Space between the buildings- almost empty	
247	0			high number on market streets	Brzeźno
248	0			high number during the holiday close to the pier and old sanatorium's area	
249		*are the people passing by rather old or young, are children visible?*	*age of people passing by*		
250	0			Mostly over 40 y.o.	Nowy Port
251	0			The people are rather mothers and children and elderly people	Przymorze
252	0			The children playing are visible in the school areas	
253	0			Eldery people on the streets, children on the playgrounds, students	Żabianka
254	0			People people of all ages	Jelitkowo
255	0			a lot of older people - tourists and locals	
256	0			Eldery people on the streets, children on the playgrounds, students	Brzeźno

Table 4. Matrix of the parameters
Source: own construction

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
form of ground floor	defing type of function	defining connections/intensity	sharpening/tactile/acoustic/visual	collecting/inviting
access to ground floor and upper floors	attract specific functions/attractivities	hints the design specs	loudness	predispose

1					
param.	coastal	description	parameters		
		categories	parameters	sub-parameters	districts
		narrative			
257			*locals*		
258	0			Strong neighbourhood attachement	Nowy Port
259	0			Strong identyfication with district	
260	0			People are commited to the district	Przymorze
261	0			The people identify with Przymorze	
262	0			Taking care of neighborly bonds, "Stowarzyszenie Żabianka"	Żabianka
263	0			small society, mostly eldery people	Jelitkowo
264	0			coherent lifestyle choices of inhabitants of certain parts of the district	Brzeźno
265			*street life*	street vendors	
266	0			One street garden	Nowy Port
267	0			People with alcohol	
268	0			Street events	
269	0			Low - not a typical activity for this district	Przymorze
270	0			Strolling through the promenade, sitting on the benches	Żabianka
271	1			slow life, recreation	Jelitkowo
272	0			hot dog stall on the way to the sea	Brzeźno
273		*how people are treating the space between building and the street/ backyard/ frontyard?*	*border among private and public space*	treatment of semi-public spaces	
274	0			Borders are very clear or none	Nowy Port
275	0			No clear division between public-semipublic-private spaces	Przymorze
276	0			Majority of the space is public	
277	0			Majority of the space is public	Żabianka
278	0			Private gardens	Jelitkowo
279	0			Majority of the space is public	
280	0			section between Chodakiewicza and Hallera	Brzeźno
281			*tourism*		
282	0			Little influence of tourism	Nowy Port
283	1			Tourists hardly visible and recognisable	Przymorze
284	0			No tourists' services, souvenirs etc	
285	0			No tourists' services, flats for rent only(summer time)	Żabianka

classes of impact				
architecture	**use of space**	**planning**	**senses**	**people**
creating cultural codes	defining common spaces/specific functions	hints the local places	n/a	homeliness
form of ground floor	stimulating new functions	enlivening/enriching	loudness/acoustic/visual/tactile /sharpening	attract/collect
deifining passages, openings and barriers	determining functions/ level of activity	structuring, dividing	visual	predispose/orienting
character of place, authenticity, attraction	attracting specific functions	potential/functioning	loudness/acoustic	predispose

3.2.2. DIAGRAMS

The graphical visualization possess a greater strength than a written description to convey information in a clear and instant way. It is exactly this immediacy that a text usually falls short of. That is why infographics are so popular today and begin to play an important role in the transmission of information. What intrigued us in relation to diagrams is the possibility to look beyond the simple datum. A carefully drafted diagram in fact implies a process of transformation over data that enable to foresee their behaviour under specific conditions. By this point of view a diagram is an operative tool, to decipher the reality, to interrogate the very nature of a datum.

Antony Vidler (Vidler, 2001) in particular focused on the operative nature of diagrams. He observes how the very definition of diagram (from the Greek *diagramma*, *dia* across/through, *gramma* something written that is marked out by lines, a geometrical figure, written list, register, music annotations) points out how it works as a figure composed of lines, serving to illustrate a statement, or to aid in the proof of a proposition (Vidler, 2001: p. 84). The diagram it is a representation of a kind of reasoning, it is an icon, and possess the crucial function of "pointing" (Vidler, 2001: 85). In this way it is not a passive device but an instrument able to address a transformation. Already Gilles Deleuze had formalized the concept of diagram in terms of "abstract machine" able to produce reality (Deleuze, 1988: p. 34). He elaborated the argument in this terms: *The diagram or abstract machine does not function to represent, even something real, but rather constructs a real that is yet to come, a new type of reality* (Deleuze & Guattari, 1987: p. 142). More recently, in a quite similar fashion, R. E. Somol argues that diagrams possess both projective and performative qualities more than simple representational. Eventually he offers this definition for the diagram: *is a tool of the virtual rather than the real, and a means of proposing a world other than that which exists* (Somol, 1999: p. 24). This conceptualization of the nature of diagrams becomes central for our experimental approach as it focuses on their use to venture interpretation.

For the formalization of the results of the research different kinds of diagrams and graphs have been experimented with, depending on the case drafted in a personal fashion or after the inspiration provided by the book *Information Is Beautiful* (McCandless, 2009). The author of the book spent many years to design infographics, founding new and interesting ways to present information in an unconventional way.

Whereas the drawings and diagrams drawn during the first phase of the study, following critical walking, merely depict the subjective perception of the identity of the district aiming for a holistic general description, the diagrams from this second phase aim not only to describe, but analyse. They focus not on the overall identity of the area, but on singular parameters constituting on this identity and their correlations. We experimented with different kinds of diagrams, looking for ones that would clearly depict changes of certain aspects of the identity, described by parameters, in time and place. Examples of diagrams constructed in this part of research are described below:

PARAMETERS PATH SECTION

The *Parameters path section* diagram shows the development of the parameters along the path through the analysed district. The paths assessed were always chosen in such way to head towards the coast from the south border of the district. The path depicted on the diagram below is the most representative for the district. When only one parameter is being depicted, the diagram shows in simple way how does the particular element of identity evolve along the path. After combining multiple parameters on one diagram it is also possible to investigate correlations between the parameters or common reasons of the changes.

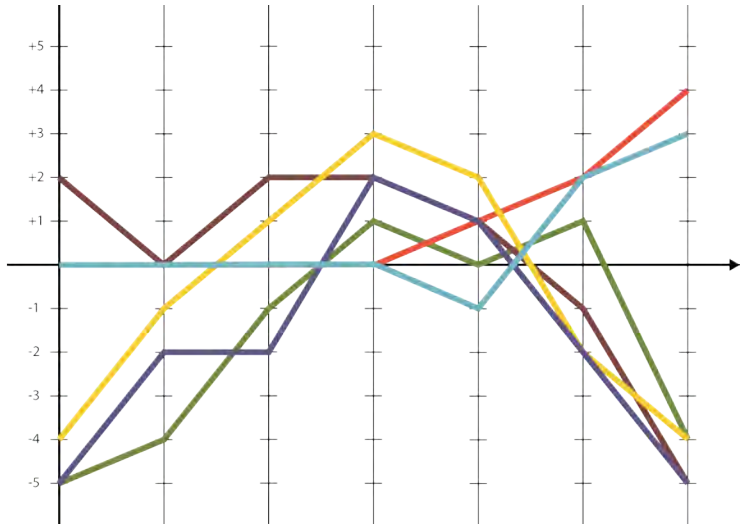


Fig. 18. Parameters path section perpendicular to the coast - Nowy Port
Source: own construction

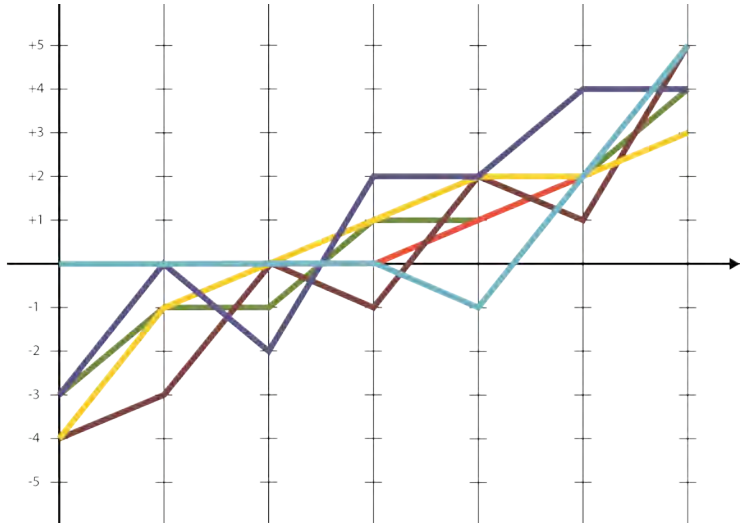


Fig. 19. Parameters path section perpendicular to the coast - Brzeźno
Source: own construction

INTEREST ENGAGEMENT LEVEL MAP

The diagram depicts the changing number of people along the paths, that was walked during the critical walking. Thanks to the diagram it is possible to analyse how the parameters investigated in other diagrams could attract or discourage the people consequently influencing the number of the people, who pass by during the critical walking.

COASTAL-LOCAL FLOOD MAP

Flood map was developed to depict the spatial development and correlation of the particular parameters. The elements of identity connected with water attract the coastal line causing "floods". For those parameters it is crucial to show that they only exist if their connection to the sea stays

unbroken. Thanks to the way of illustrating the field of influence as the "flood" it is possible to define the areas where the additional analyse are needed before introduction of new developments that could broke the bond to the sea and harm the coastal identity of the place.

Second element that was depicted on the map are places of identified local identity elements (those related to city-life in opposition to the coastal identity marked by floods). If the distance between them is close enough they create the "islands" that indicate possible strong presence of the local identity. Thanks to defining the particular areas that are characterised by the strong local/coastal identity it is possible to define the direction of the district's development in way that will support connecting the particular elements in bigger network that will frame the district.

Fig. 20. Interest engagement level map - Brzeźno
Source: own construction

Fig. 21. Coastal-local flood map
Source: own construction

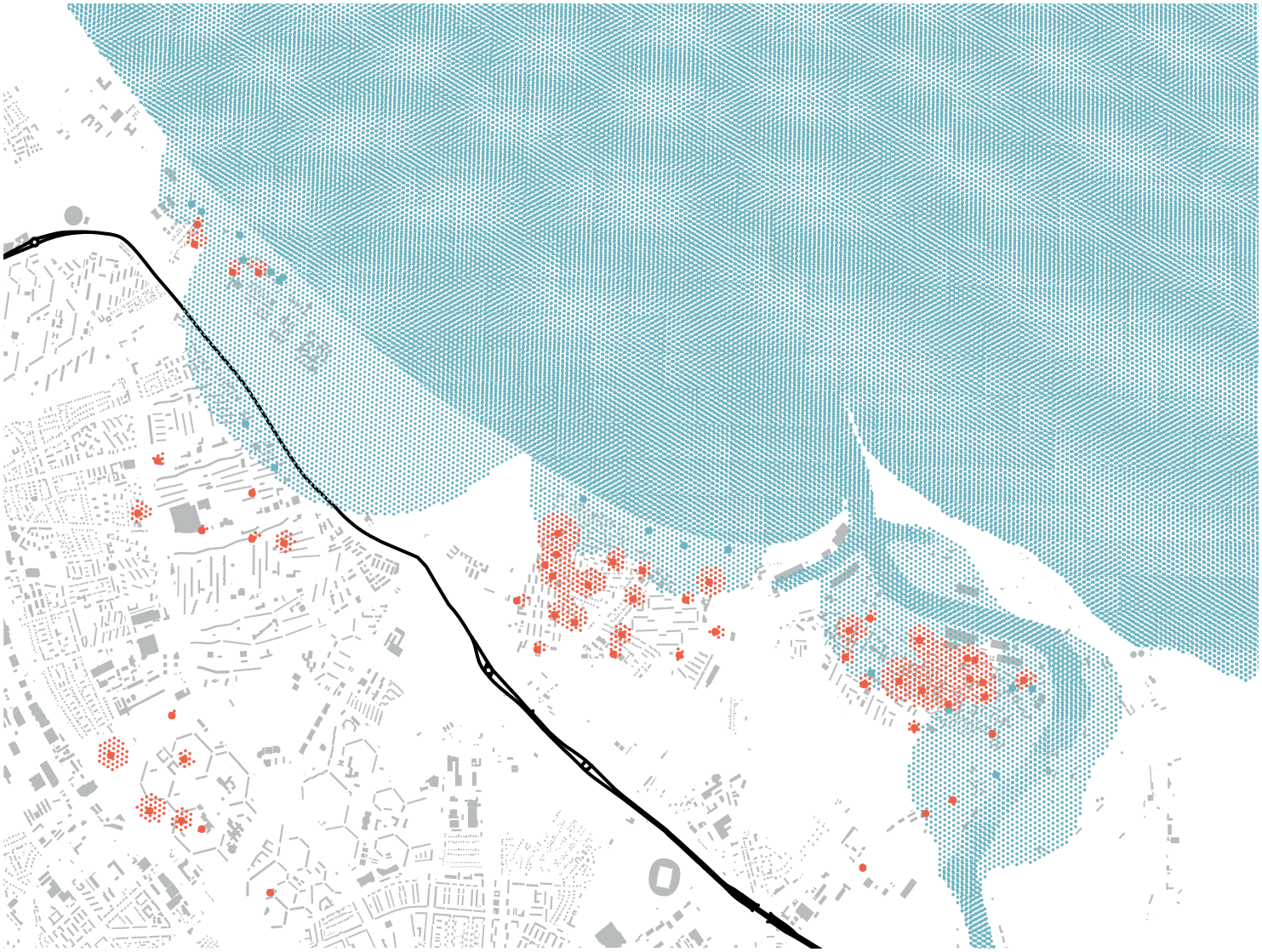


Fig. 22. Coastal-local flood map with Droga Zielona investment
Source: own construction

DOMINATING PARAMETERS MAP

The map illustrates the correlation between the grade of influence of particular parameters, showing the dominating areas of each of them. Thanks to this way of illustrating of outcomes from earlier analyses it is possible to define which elements of identity have the biggest influence on it. Moreover it enable to investigate which elements of the identity should be further analysed to reframe the identity of particular area.

Fig. 23. Dominating parameter map - Nowy Port
Source: own construction

Fig. 24. Dominating parameter map - Brzeźno
Source: own construction

3.3. RE-ARTICULATING IDENTITIES / DATA VISUALIZATION (INTERPOLATION)

After an attempt to answer the questions of *What is the identity of these districts?* and *How is it articulated?* in the first two phases of the research, the third phase focuses on the re-articulation of studied identity. The aim of this phase is development of tools that could turn the gathered data into guidelines for future scenarios, thus increasing importance of the intangible, immeasurable factors in the design process. A direct inspiration for our work in this phase was Dr Dominiczak's study on urban identity:

The Urban Identity Code's role includes establishment of the 'big picture' by identifying the strategic city areas available for new development, followed by the individual urban design codes for each area. The big picture step is also critical component of preparing the strategy – the most damaging effect of new developments in historic cities becomes apparent only over time and after the accumulated deterioration of the urban fabric through a series of incremental impacts of individual developments has taken place and too much urban heritage has been forever lost in the process (Kiera, 2011, p.4).

The described process is very difficult and there is a threat that some aspects of identity, that are crucial for successful functioning of the urban area are either not noticed or were not a field of study. Controlling the development of the local identity needs permanent observation and understanding of correlation of all the factors that create it, not only that that are measurable by one of the method, that was chosen to investigate the local identity.

As mentioned in point 3.1., there are several methods, such as strollology, to measure the physical aspects of identity. However there are focused on the very subjective aspects that may be only perceived by the the scientist or very objective information that have been studied, published and explain the life of the community.

The social aspects of the city's identity are also the part of the local Identity and therefore are also described in the design code. However they are very difficult to identify by scientist studying the local identity. Some of physical aspects of local identity are explained in terms of the social role of the architecture. Because design code is mostly focusing on the physical features and appearance of the city's architecture from the scientist's point of view, locals' perception of architecture often stays unnoticed in the study. Despite the fact that the mentioned aspects could also determine local identity, they have very little influence on design code. For that reason there is a need to create the approach that could visualise the complexity of the local identity and at the same investigate the particular factors.

3.3.1. VISUALISING IMMEASURABLE

Probably the biggest issue in creating such a tool is the visualisation of data that would reflect the complexity of relationships between the described in previous chapters factors. Several possibilities to visualise the particular factors that create the identity were described already in points 3.1.2.1 and 3.2. However, the difficulty of visualising the identity is that it is not only crucial to understand particular factors, but to figure out all of the connections and relationships between them. Therefore, at the beginning of the third phase we focused the interrelations between parameters, wanting to understand better how the identity can be rearticulated by change of one of the factors. At this point it would be vital to create art of the interactive map, that could emphasise some of the data to make it readable still showing the correlations of it with the other aspects of the identity.

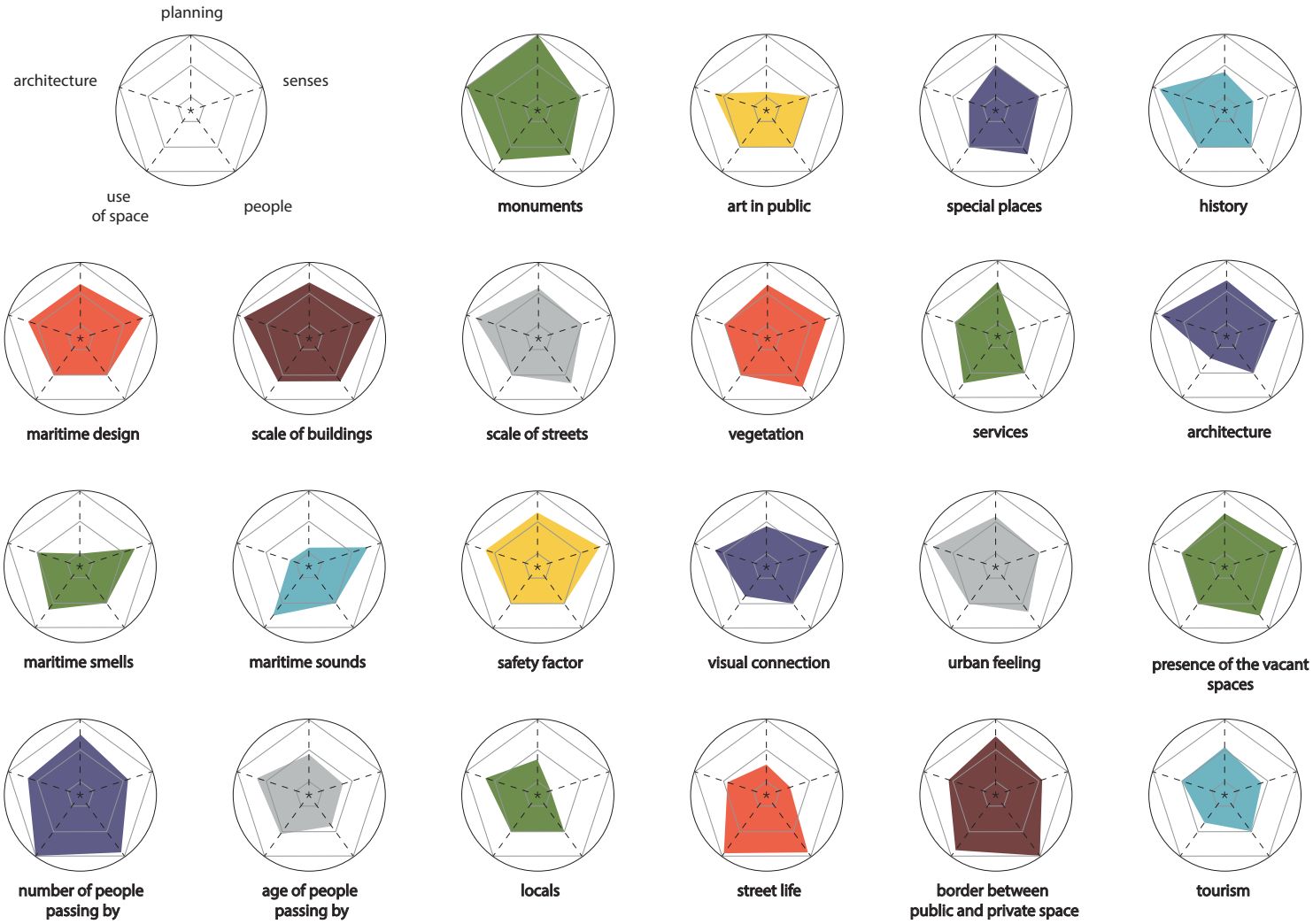


Fig. 25. Radar diagrams
Source: own construction

RADAR GRAPHS

One of the problems in visualising such complex groups of data is the great number of the arts of the classes of impact on the parameters, which makes the matrix very difficult to read. Because of that, it is difficult to analyse the elements of identity and to decide, which parameters to choose to reframe the identity - by manipulating when there is great influence on the identity or to develop when there is no relationship between element and identity. Radar diagrams are a very helpful tool to analyse the existing influence of all parameters on one of the elements of identity, and they very clearly depict the classes of impact on the particular components.

The variety of shapes also helps to investigate how parameters correlate with the different elements of the identity and to find those, that are responsible for the aspects that are important at this stage of study. Thanks to that features the radar diagram can be easily used as the "guide" not only through

the information contained in matrix, but also to navigate through the causal diagram described in next paragraphs.

A good example that shows how the radar diagram might be used is the case of analysing all of the arts of influence on identity in particular parameter. Radar diagram enables to describe physical, sensuous, cultural and economical aspects of the element at once, helping to understand how it's functioning and how it fits in the complex network of correlations that are creating the community.

CAUSAL DIAGRAM

A very complicated network of influences and connections between the parameters is hard to depict on one diagram. Visualising it required creation of a map where the particular data not only exists as individual factors or small groups, but also creates patchwork that shows the most important areas for the districts. Defining the most important areas makes it possible to focus on further studies using diagrams analysing defined parameters only in places that need it before introduction of new developments in that place.

To investigate the correlations between particular elements of the matrix, the causal diagram was developed. It shows very well the relations between elements of the identity framed in matrix which are not obvious, and are usually neglected by investigating them scientist. Diagram depicts not only the class of the impact and its strength but also how some elements of the identity could be changed by influencing different parameters.

The thickness of the lines represents the strength of the relation between two parameters. The arrows show the parameter that is being influenced and one that is influencing, creating a network of correlations. Between the parameters in the rectangles we described the way a parameter is influencing another one, to make it easier to understand how the network is working. For example "*street life"* influences *"senses"* by sharpening them only to a lesser extent. But "*the distance to the sea"* has a great impact on *"senses"* due to stimulating the smell and sounds. Conclusion driven from this example might be that it is important to investigate the areas close to the sea to protect the "non physical" connection to the sea. Moreover, by investing in the "*street life"* we do not need to consider it as the important factor to frame the sensual aspects of the identity. Thanks to the organization of the data in such way it is possible to investigate correlations between the elements of identity that usually stay out of consideration - and to reshape some aspects of the local identity not only by modifying them, but also by developing elements, that have direct influence on them.

A careful analysis of causal diagram can connect the objective, physical and narrative elements of the identity. By questioning "which buildings are in common sense important for inhabitants and why?" there is possibility to follow the connection of the elements that represent the narrative and physical elements of the space and to find the connection between them that answers how do they correlate within the local community. The effect of such analysis could be further a study on the problem with the aid of previously mentioned methods focusing on the socio-physical aspects.

The other possibility is to investigate the results of the former analysis to find new connections between the parameters. An example of it could be questioning the reasons of decreased flow of people in some part of the districts. The causal diagram gives the examples which parameters, including all aspects of identity, could have an influence on that outcome.

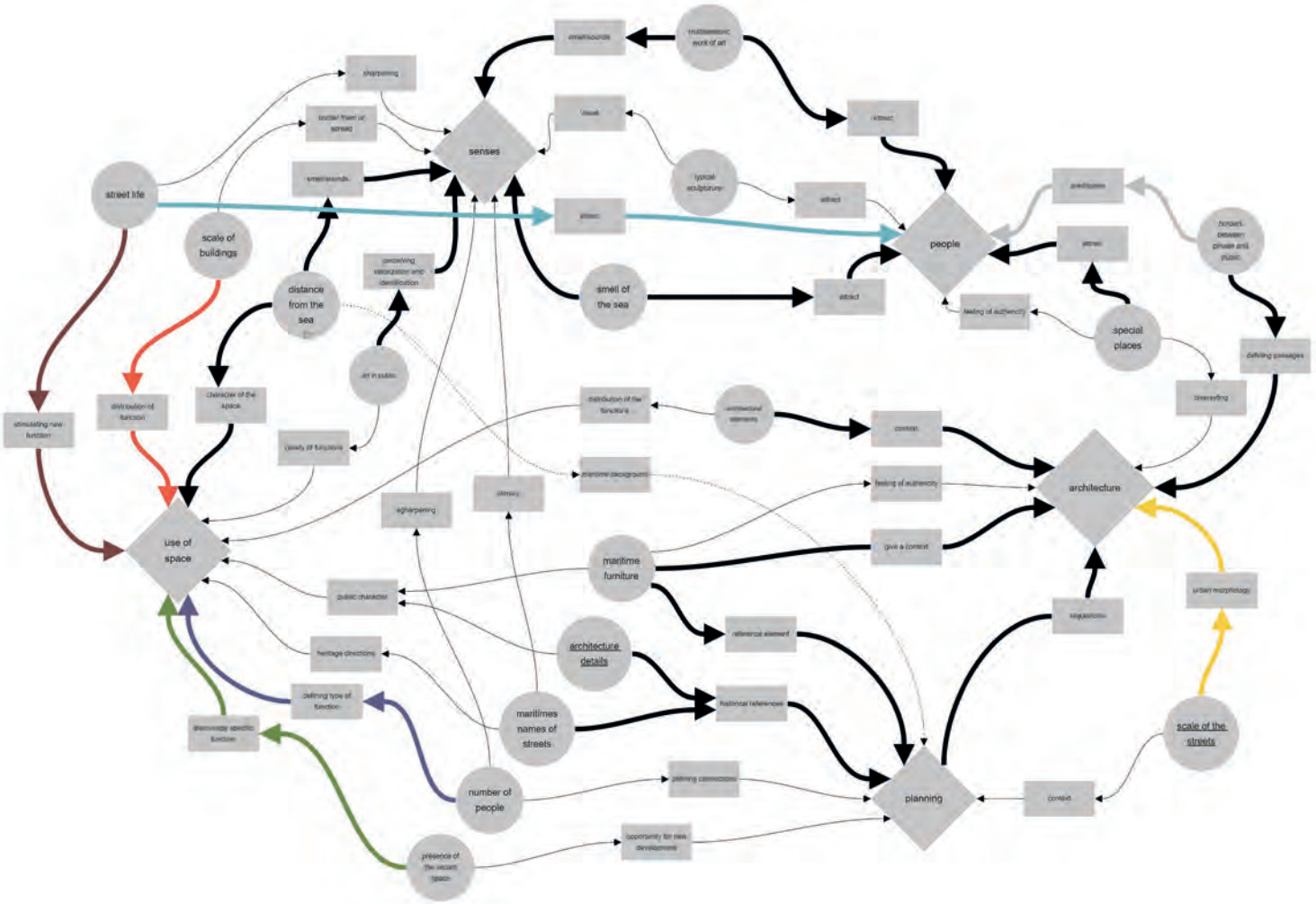


Fig. 26. Causal loop diagram
Source: own construction

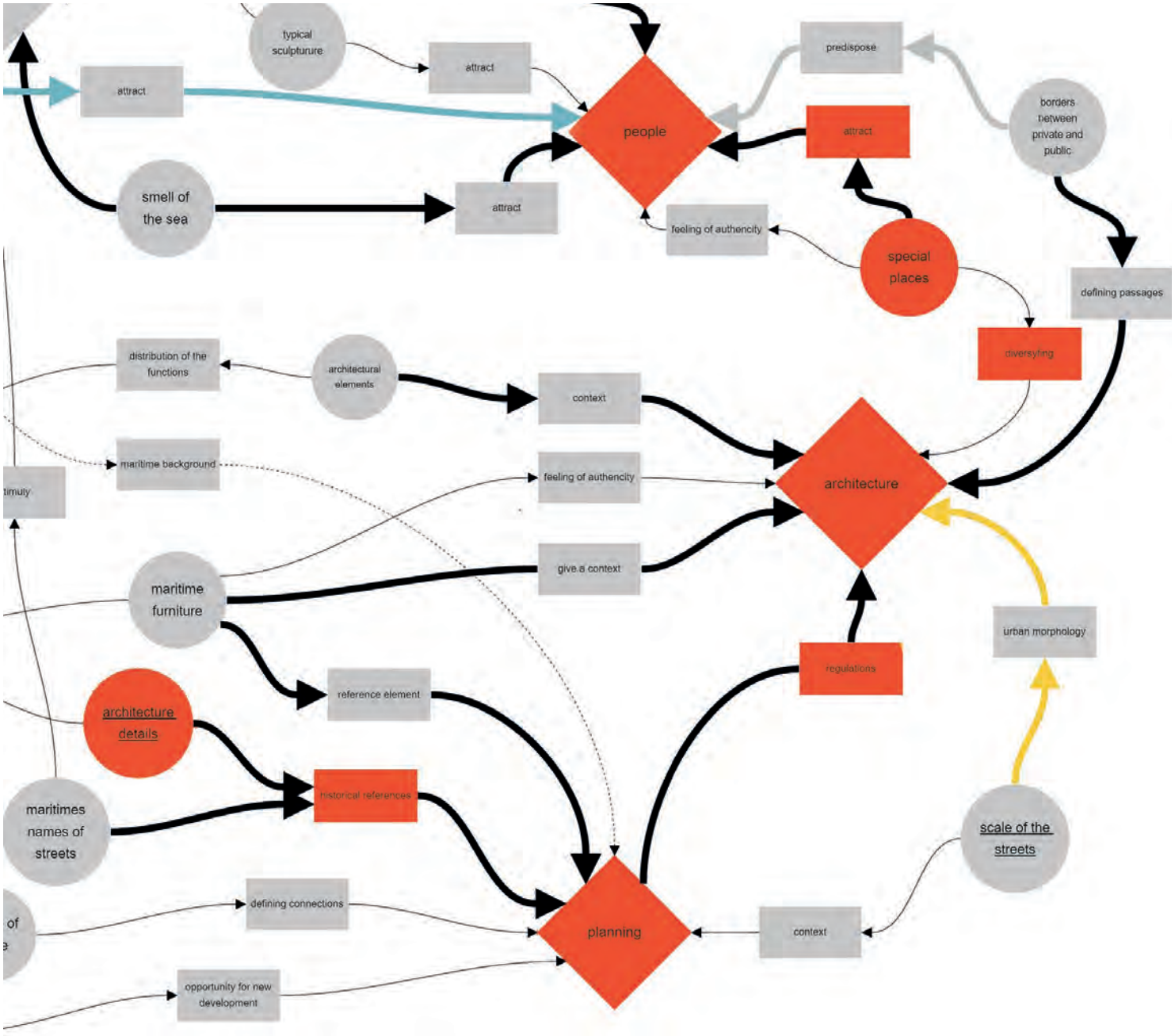


Fig. 27. Fragment of causal loop diagram
Source: own construction

3.3.2. CREATING THE PLAN FOR FUTURE DEVELOPMENT

The very last step of the research is concerned with preparing scenarios for future development taking into consideration all the collected data on local identity, its articulations and correlations between them. To create a plan for the future development of any area using the constructed matrix it is very helpful to prepare a table that includes the parameters that have a great impact on the elements of space/identity that we want to re-frame, so the the suggestions for the future can be prepared on behalf of it.

3.3.2.1. DESIGN CODE

In case of northern edge of Gdańsk, the aim of the re-articulation of identities was to increase the strength of vibrant identities of the coastal district that could compete with the historical centre. As many baltic cities are characterized, similarly to Gdańsk, by a solid historical core enveloped by walls and canals and a series of district on the coast, this could be the aim strategy for many of them. To strengthen the existing identities, we looked in the matrix for the strongest articulations of district's identities - a big red spots on the matrix. The same tool could be used differently if the aim of the re-articulation of the studied area would be to reformulate the its identity (e.g. for districts with high level of crime or slums). In this case researchers should focus on the yellow spots of the matrix - that represent articulations that are not used yet and can transfer new value for tor the space. After analysing the matrix, with help of visualised in causal diagram data, the group has chosen pairs of parameters and classes of impact, that have greatest influence on the other elements of the identity. For those parameters and classes of impact a design code was prepared.

In Design Code (top part of the table below) for each relation between a parameter and a class of impact we prepared general recommendation for future development of the space. There is

	PARAMETER	CLASS OF IMP	GENERIC RECOMMENDATION		
			NOW	FUTURE	FAR FUTURE
70	scale of the buildings	use of space	more space for people and greenery	arranging the ground floor for service function	network of complementary different functions
93	scale of streets	architecture	more space for people and greenery	new architecture (filling the gaps)	new architecture (new complexes)
226	presence of the vacant spaces	use of space	introducing green space	temporary arrangement of vacant space / seasonal function	new architecture
235	number of people	use of space	infrastructure following function	arranging new spots complementary for present function	network of complementary different functions
265	street life	use of space	cleaning / visual atrractiveness	events / temporary objects and furniture	creating new places
265	street life	people	cleaning / visual atrractiveness	events / temporary objects and furniture	creating new places
273	border between private & public	people	arranging backyards / cleaning streets	urban furniture / visual atrractiveness	ensuring continuity between public spaces

	PARAMETER	CLASS OF IMP	GENERIC RECOMMENDATION		
			NOW	FUTURE	FAR FUTURE
70	scale of the buildings	use of space	defining the height/rearanging facades	arranging the ground floor for service function	network of complementary different functions
93	scale of streets	architecture	rearanging street	new architecture (filling the gaps)	new architecture (new complexes)
226	presence of the vacant spaces	use of space	introducing green space	temporary arrangement of vacant space / seasonal function	filling up urban structure
235	number of people	use of space	arranging new spots complementary for present function	more fair distribution of space among different users of streets (including: pedestrians, cyclists, public transport, private transport)	network of complementary different functions
265	street life	use of space	cleaning / small changes for visual atrractiveness	objects / urban furniture defining maritime identity - strengthening the character of public space	network of public spaces
265	street life	people	cleaning / visual atrractiveness	events / temporary objects and furniture	creating new places
273	border between private & public	people	arranging backyards / cleaning streets social actions of arranging backyards	urban furniture / visual atrractiveness	ensuring continuity between public spaces

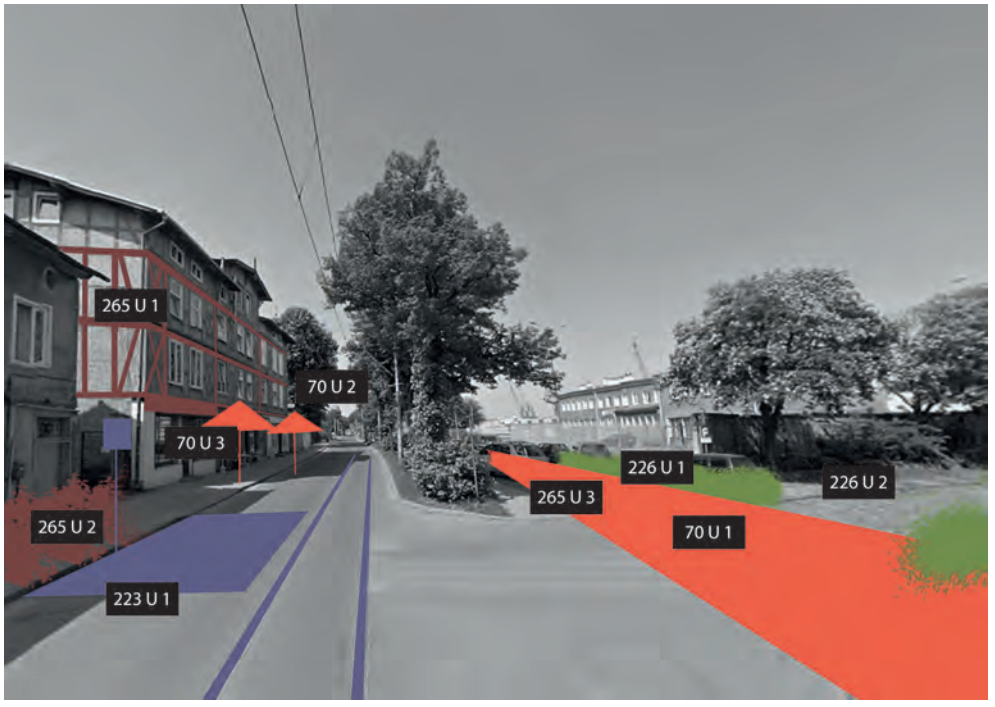
Table 5 - Design Code and recommendations
Source: own construction

always recommendation for present situation, near future and long-term recommendation. All three can be applied for any of the coastal districts of the baltic cities. If this approach would be developed further into a scientific method, a set of generic recommendations for all possible relations between a parameter and class of impact should be developed - thus creating a full Design Code. For the sake of this study we narrowed the scope of the Design Code only to those recommendations relevant for Gdańsk's districts.

The recommendations included in the Design Code are generic - as they are focused on the way the identity can be re-articulated rather than the character of the identity itself. Only after merging this information with the results of the first phase of the study (which described current character of the district) a more specific recommendations can be developed. In other words the design code proposes strategy to re-articulate the identity. The second step, proposing specific actions, is developed on the base of the design code and data collected during the first phase of the research - *Exploring Identities*. On the basis of the general recommendations for Gdańsk, following same rules were prepared the applicable recommendations for the future development of the districts.

3.3.2.2. RECOMMENDATIONS

To explain the functioning of the design code better, the second part of the table is visualised in form of the sketches below. Shapes of the possible future developments in colours that represent the colours of parameters in the design code table were applied on the photo of the coastal district. The shapes are also described by the numbers of the recommendations. The numbering system includes number of the parameter derived from the matrix, symbols representing the class of impact (U-use of space/ P-people/A-architecture) and the numbers that match the perspective of application (1-now/2-future/3-far future).



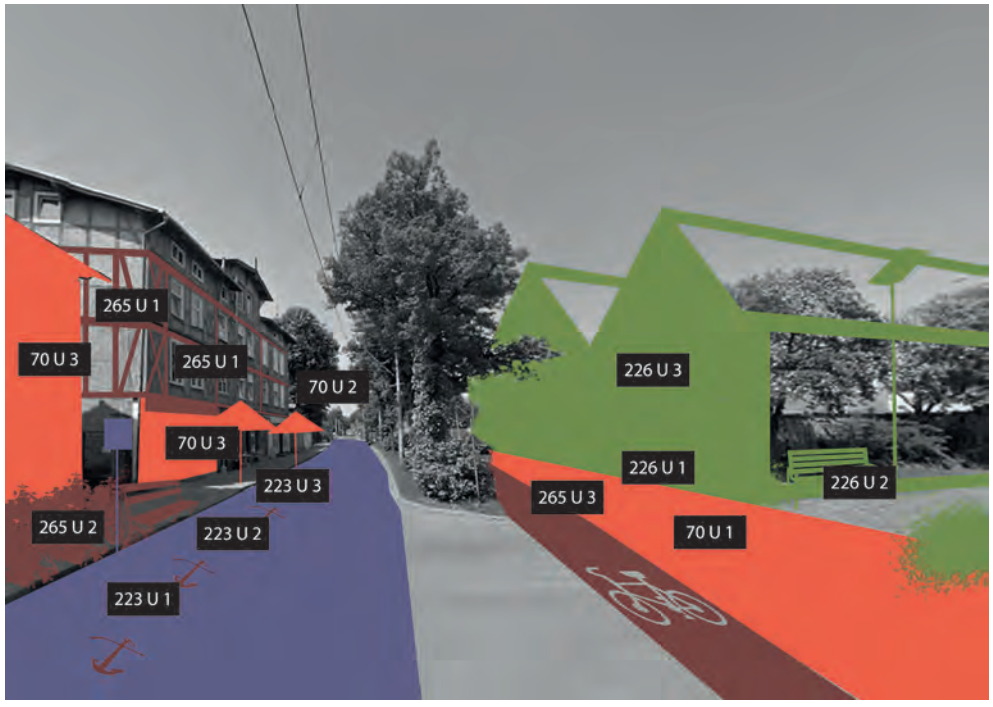


Fig. 28-31. Recommendations visualised
Source: own construction

4. SUMMARY:

Our research showed how diverse elements of place identity can be. Although, we were trying to capture the essence of the coastal identity, it turned out, that every district has its different individual coastal character. Consideration of sensory aspects, showed how far seaside character reaches from the coastal line. Some parts, that are physically very close, practically are cut out from the water. Usually problems are complex, expressed in different parameters and fields of impact. Detailed analysis of the place, taking into account the various subjective and objective aspects can help to find the right solutions. Combining subjective and objective data gives full picture of place character, and shows how sensorial perception cooperates with city structure as well as use of space. Translation of intangible qualities into the language of numbers and easy readable diagrams changes them into measurable parameters and factors and gives an opportunity to really enable them as an outlines to sustainable urban planning.

Deeper analysis of the parameters and refine methods of collecting detailed data can be a way to develop our approach into scientific method in the future. Precise and accurate recommendations divided on three distances of time may become a universal tool for policy planning, special development and heritage preservation.

A significant influence of subjective perception and invisible, intangible qualities of space on place identity seems to be obvious. The questions arises – how to introduce the importance of them to multiple stakeholders like City Council, architects, city dwellers etc.? How to sustain the local identities in the future city planning processes?

4.1. STRENGTHENING THE COASTAL IDENTITY

One of the very difficult to identify aspects of identity present in the districts of the baltic cities is coastal identity, that is often created by very difficult to measure parameters, such as safety, senses or subjective feel of presence of the water. The coastal identity is an opportunity for the seaside districts to become present on a mental map of the city and determines the future development. At the same time it is very easy to waste the potential of the coast trying to develop local identity, caused by not knowing the relationships between them and the actual functioning of parameters creating coastal identity in the district.

4.2. OPPORTUNITIES FOR FUTURE USAGE OF THE METHOD

The city is the common effort of many groups that have different often contradictory interests. The urban planning is a complicated process where the groups of interest - the stakeholders of future investments try to get most of them. The participation of the groups depends on the model of planning (Schönwandt, 2002: 7-29; Fainstein, 2000: 451-478) Independently of the fact, if and how much the particular stakeholders participate in the design process there is always a need to define the identity of the place that will be a base for the further discussion or decisions. But a tool that helps to frame the identity could become itself the platform of discussion. The influence of the tool that increases the interaction within community on framing the identity could be considered by two different aspects:

- the tool that helps community act as the group that can oppose other stakeholders
- the tool that frames local identity by creating the possibilities to create common idea of the district.

STRENGTHENING THE SENSE OF COMMUNITY

The first aspect is that community as a group can better oppose the other stakeholders by

protecting the elements of the identity that are important for them as community, but not always are considered as so important by single members of community. The issues very important for the locals are often rejected by city-hall or developers because the local community is not realizing the threats to some existing features of the space, that shapes the coastal/local identity of the district, is not united to protest against the change or united local community protest against the public or private investment not knowing benefits that can occur to the identity of the district after investment.

The cause of those two examples are mostly difficulties in understanding by locals the way how the district and planning function. When the physical aspects of planning are already well represented by the investor so that the local community could understand how and why some actions are undertaken and the community can easily unite to protest against or protect the physical issues of the space, there is still the problem of communication and understanding the non-physical aspects of the space.

A good example here is the new project of Droga Zielona in Gdańsk, currently called by City Hall of Gdańsk Zielony Bulwar (the Green Boulevard). It was very easy for the local community of districts Przymorze and Zaspa, that will be cut off by the new investments from the sea coast to oppose against physical aspects of the planned road: its width, lack of greenery along the road or not enough crosswalks. But the physical appearance of the road and its influence on the local identity of the district is only one aspect. That what stays unexplored is the influence of the road on the coastal identity of the districts. The physical connection to the sea is only one of the examples - would the road make the connection between the urban area of the district and coast easier or would it be a obstacle for the inhabitants causing reduction in the coastal identity of the district.

Furthermore, there are some parameters that will be influenced by the new road, and are not to investigate using methodology present today: what will be influence of new road on perception of marine smells or sounds in the districts cutted off by the Boulevard? Will the visual connection to the sea in district be still present after planting the green alley? Would new developments initiated by new connection increase the maritime or local character of the architecture in the districts? As it was mentioned before those parameters function also in the complex network and some of them have direct influence on very physical or social parameters of the local identity. As an example the influence on the safety in the district can directly affect flow of the people or sounds and smells could be crucial for the type services that are present in districts. Only by investigating all of the aspects and exploring the correlations between them the questions about the effects of the new developments on the coastal and local identity can be answered.

How to promote the social dimension of identity?
The second aspect focuses on the question of how to get most out of the local community, that is not only the recipient but also the promoter of the local identity. Very similar places, such as squares or streets become popular because of many different, both qualitative and quantitative aspects. The physical features or the social situation in the district defining needs of the local community are quite important, but very often there are other parameters, difficult to frame by "traditional" sociological or urbanists' definitions, that are determining if some place is popular or not. If we consider the city and its identity as complex assemble of social, historical, cultural, and physical attributes of the space it occurs that sometimes it is almost impossible to study, identify and describe identity by graphs or texts. This example is well depicted by the project 'Write on this' organised by artist Jean Hester in 2004 and described by David Pinder in 2005.

> In a project called 'Write on this' in 2004, media artist Jean Hester encouraged interaction

> with walls and the atmosphere of places by entering into dialogue with voices already there. She placed nine posters in public spaces in Lower Manhattan, each featuring a question above a blank space, and each with a black marker pen attached on a string. These posters invited people to engage with the particular spaces and respond to their feelings at that moment, through questions that included: 'What is beautiful here?', 'Where do you want to be right now?', 'Do you feel safe here?', 'What would you change about this place?', and 'Where were you the last time you smiled at a stranger?' The project came out of her more general aim in her work, based on her belief that 'awareness, being nudged slightly more awake, is the first step towards changing our culture (Pinder, 2005b: 393).

It shows how with the very simple tool it was possible for the artist to explore the dimension of the city that is invisible for the architects and urbanists, and only very difficult to investigate in conventional questionnaires by sociologists. It shows that identity not only exists in the local community as the collection of individuals but also is created by the common consciousness of its members. Therefore it is difficult to investigate all of the aspects of the local identity including the social life of the community. But only the holistic approach - including physical and social aspect of identity leads to valuable outcomes. Therefore, creating a tool that is focusing not only on physical elements of architecture and the morphology of the city, but also studying social aspects of the city, local identity created by the inhabitants in attempt to describe all various dimensions of identity is a big opportunity.

Sometimes not obvious correlation between the parameters that creates identity can influence very important processes that at the end can help to change the district or to define problematic areas of the district. To study the common opinion of the place and the communal identity the visualised data should be also the tool itself, that reacts to the incoming data and functions like Jean Hester's work of art a dashboard to collect data from people. It should open the discussion and promote and strengthen the common sense of district giving the impulse to shape it according to developing new identity.

HOW TO PROMOTE THE SOCIAL DIMENSION OF IDENTITY?

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MULTICULTURAL COASTAL CITIES: WHAT ARE THE DIFFERENCES IN CULTURE OF URBAN PLANNING MANAGEMENT

COMPARISON ANALYSIS OF GDAŃSK AND GDYNIA

The goal of this book chapter is the analysis of the multiculturalism of the seaside cities (Gdansk and Gdynia). We define multiculturalism by ethnic aspects, as concentration of multiple nationalities and ethnic groups over the given area and non ethnic aspects, as occurrence of multiple symbols, signs or cultures. We sense multiculturalism of the cities through the cultural and social properties of the citizens and urban architecture. The cities become diverse not only in the material but also in the symbolic area, they are spaces were strangers live beside each other. Its foundation is mostly the migration phenomenon which favours the transfer of the cultural standards (displayed not only in language and values but also in the attire or lifestyle). It should not be forgotten it is expressed also in the architecture (objectifies cultural diversity in urban area). The aim of publication is to distinguish the differences and similarities in culture of urban planning management in Gdansk and Gdynia by using criteria from good governance idea (participation, answering to needs of citizens, responsibility, equality and inclusion). The purpose is to find good practices, elements of multicultural policies in cities under consideration and defining its character. The analysis is conducted in three areas: cultural, social and architectural by using different research methods: desk research, index of participation, self-completion questionnaires and behavioural mapping. We can observe that despite the cultural variety and tradition that is a repercussion of the history of the cities, it is more and more challenging to obtain idealistic cohesion of the city. A lot is being done in the field of celebration the differences and providing knowledge about approaches of various cultures. However, a lot must be done in the area of introducing new facilitations to provide the access to information and space for everyone.

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MULTICULTURAL COASTAL CITIES: WHAT ARE THE DIFFERENCES IN CULTURE OF URBAN PLANNING MANAGEMENT? COMPARISON ANALYSIS OF GDANSK AND GDYNIA

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1. MULTICULTURAL COASTAL CITIES - NEW CHALLENGES OF URBAN POLICIES

1.1. WHAT ARE MULTICULTURAL CITIES

The world today is [...] great construct of chosen elements of actual cultural legacy, evaluative measures and subjective socially created hierarchy of values: «culture» becomes what people want it to be. This is multicultural world…" [Burszta, 1997, 31]

How to understand and define multiculturalism distinguishing it from strong political slogans? Nowadays, when everything is changing rapidly, mixing members of different nations and races all over the world, multiculturalism has become a crucial issue. Multiculturalism is only the sign of the present times though? We dedicate this part to establish the theory. As phrased by Berry (2002: 375):

> "multiculturalism was identified as the orientation that accepts both the maintenance of cultural identity and characteristics of all ethno-cultural groups and the contact and participation of all groups in the larger plural society this understanding of the term, linking it to the two issues involved in acculturation, was proposed as way to provide a psychological basis for evaluating canadian multiculturalism policy"

about which we write later. Diving in the anthropological understanding of multiculturalism we can detect historical background. All ancient civilizations were multicultural and the task of assuring harmonious existence of people of different faiths, cultures and languages stood before the rulers.

> „In traditional multiculturalism we could differentiate two ways of perception: separate ethnic cultures situated in social space treated as property (…) and multiculturalism of urban diversity of which first documented example was the rome under the reign of august"

(Burszta, 2008: 22). Historical aspects aside burszta differentiates three levels of understanding and arranges definition of multiculturalism. First level is connected to empirical facts: we verify (or not) that in given society cultural diversification occurs (distinctive religious or ethnic groups); the second one pertains to understanding on the level of social consciousness. It is expressed through social standards that regulates and approves multiculturalism on the first level. Third level on which

> "multiculturalism takes on the form of ideology which promotes acceptance and appreciation through opinion-forming environments of multicultural life forms relevant especially in urban conditions"(Burszta, 2008: 22).

Rosado directs attention to modern aspects:

> "multiculturalism, as the new paradigm for education for the 21st century, is a political ping-

> pong term greatly misused and highly misunderstood. Since for many it is also a value-laden concept, it has come under fire from diverse segments of the population, who due to their social position view the world differently".

Rosado based his definition on multiculturalism on the system of beliefs and values which recognizes and respects diversity of groups in given societies (rosado, 1996: 2). Golka on the other hand refers to multiculturalism as

> "occurring in the same space (or in immediate neighbourhood without the distinct demarcation or in situation of aspiration to occupy the same space) two or more social groups of different distinctive cultural traits: outer appearance, language, behaviour, background, system of values etc., That contributes to shared perception of dissimilarities with different results" (Golka, 1997: 176-177).

It is also multiplied by the migratory politics. This will be the definition used by us for work. It is worth mentioning that diversity in the usage of cultural code applies for example to hearing impaired or people who, because of alike lifestyle, create groups, subcultures. Inglis notes that presence of different cultural identities creates a need to cope with the management of ethnic and cultural diversity through policies which promote ethnic and cultural minority groups. She also claims that multiculturalism, as a systematic and comprehensive response to cultural and ethnic diversity, with educational, linguistic, economic and social components and specific institutional mechanisms, has been adopted by a few countries, notably australia, canada and sweden (Inglis, 1996: 6).

This way of understanding multiculturalism can be a sign of its common occurrence. Mucha considers multiculturalism in two aspects: ethnic, as concentration of multiple nationalities and ethnic groups over the given area (common phenomenon in the cities) or non ethnic – occurrence of multiple symbols, signs or cultures. This definition allows assign multicultural status to most of the cities, the concept of «multicultural cities» presently occurs mostly in political discourse though. On the contrary to colonial practices in the abidance of laws of the colonized, since the second half of the XX century we can observe growing wave of claim of ethnic, national or sexual minorities. City (and country) authorities must begin to secure those groups equal share and access to public services (education, cultural, economic and social among others) and create politics for all communities. In 1971, as first country in the world, multicultural politics was adopted by canada (Janik, 2013: 15-16), to regulate terms between groups of citizens. The country supported the development of cultural identity, learning of languages (one of two official languages of canada) and eased the access to participation in public life (government of Canada, 1988). In Sweden official multicultural policy was adopted in 1975. This policy was based on three assumptions: freedom of choice, equality and partnership (Berry, 2002: 376). Official politics of multiculturalism was adopted also by australia, new zealand, united states of america. To 2010 the official politics was not adopted by members of European Union.

We sense multiculturalism of the cities through the cultural and social properties of the citizens and urban architecture. The cities become diverse not only in the material but also in the symbolic area, they are

> "spaces were strangers live beside each other" (Bauman, 2003: 224).

Its foundation is mostly the migration phenomenon which favours the transfer of the cultural standards (displayed not only in language and values but also in the attire or lifestyle). It should not be forgotten it is expressed also in the architecture (objectifies cultural diversity in urban area). Basic

features of the cities are

> "sociocultural heterogeneity, vertical and horizontal activity, multitude and diversification of social groups, plenitude of social connections, mostly in public life, anonymity and disappearance of neighbour ties, which are fundamental attributes of rural societies" (Golka, 2010: 141).

We can use different criteria of multiculturalism of the cities. The first one can be the percentage of ethnic and national minorities living in the given cities. It should be remembered that there are cities which have immigration ancestry for example toronto (most frequently mentioned in the context of a multicultural city). In cities of poland minorities of roma, tatars (concentrated also in gdansk) or lemkos (area of subcarpathian voivodeship) can be found. The cities are also populated by german, lithuanian, belorussian or ukrainian minorities. The still-morphing warsaw is worth mentioning, where to most of the immigrants come. Important indicators are also languages used by city citizens (Sliz, Szczepanski, 2011: 56). Citizens of toronto use 140 languages and dialects (guttsman, 2007). The number of immigrants residing in gdansk can estimated at 15,000 with an upward trend. Only 3,000 foreigners are registered in municipality. Analyzing more sources, we can also find other studies which point out completely different places as the most multicultural ones in the world. A study of cultural diversity and economic development by researcher gören, points out african countries like chad, cameroon, nigeria, togo and the democratic republic of the congo. The countries rank high on any diversity index because of their multitude of tribal groups and languages. Even though the most multicultural cities are placed in the western countries, only canada was found in the top 20 most diverse countries. Among the least culturally diverse countries one can find argentine, haiti or the comoros islands, located off the southeast coast africa and thus isolated (Gören, 2012).

Nonetheless, looking at the foregoing research, the non ethnic criteria related to the theory (materialized culture, verbal diversity, architecture elements) are equally important. When we discuss multicultural cities we cannot ignore forms of interpenetrating cultures and expressions: from theme festivals promoting culture of given ethnic, national, sexual minorities, subcultures through open meetings or reflected in the structure of the city sacral buildings, closed subdivisions, hangouts of communities.

Introducing multicultural politics requires openness from both the authorities and citizens, assurance of the access to culture and societies. While analyzing diversity of the cities we assume that multicultural cities are those which are open for different cultures (codes, symbols) but also open in the process of administration which results from the necessity of adapting urban fabric to various (often mutually exclusive) needs of the citizens using different cultural codes. There is a need of discussion about how best to support the integration of immigrants with our community, how to build a peaceful integration, while managing the risks associated with social segregation and conflict on ethnic or religious. We share the view of the necessity of creating urban policies considering the complex needs resulting from multiculturalism. This is require the involvement of various policies and public services. Therefore, the analysis we used the criteria derived from the idea of good governance as a base.

1.2. SOCIAL COHESION IN MULTICULTURAL CITY

Multiculturalism in the cities imposes certain criteria in the activities of the municipalities, sets performance standards. Policy in multicultural cities should touch many areas where cultures meet (education, housing policy, social support, cultural policy, employment support, space management). Taking social aspects into consideration (in policies) it is important to note the issue

of «social cohesion». The term «social cohesion» is popular among both academics and policymakers recently; it has been studied since the end of 19th century. This concept was brought into political agenda in European Union mainly because of multiculturalism, due to increasing migration and population diversity in European countries. The concept of social cohesion appears in many disciplines such as: sociology, social psychology, psychology and mental health. It has been one of the tools to measure to what degree the society is well working together, in small and large groups. In a socially cohesive society, citizens share common values, moral principles and behavior that lead them to reach common aims and objectives, and where individuals are engaged with the political systems and institutions (Forrest, 2001: 2125-2143). A working definition is developed by the Social Cohesion Network, Canada:

> "(…) Social cohesion is the ongoing process of developing a community of shared values, shared challenges and equal opportunity within Canada, based on a sense of trust, hope and reciprocity among all Canadians." (Jeannotte, 2000)

Social cohesion is a multidimensional concept, thus it is important to consider it from both, theoretical and practical side. Researchers, academics as well as policymakers are discussing the measurement tools for social cohesion. As we can read

> "(…) Social cohesion around the world: an international comparison of definitions and issues paper, recently the European Union, the Organization for Economic Co-operation and Development (OECD) and the Council of Europe independently attempted to clarify the concept of social cohesion where they includes the following components." (Jeannotte, 2000)

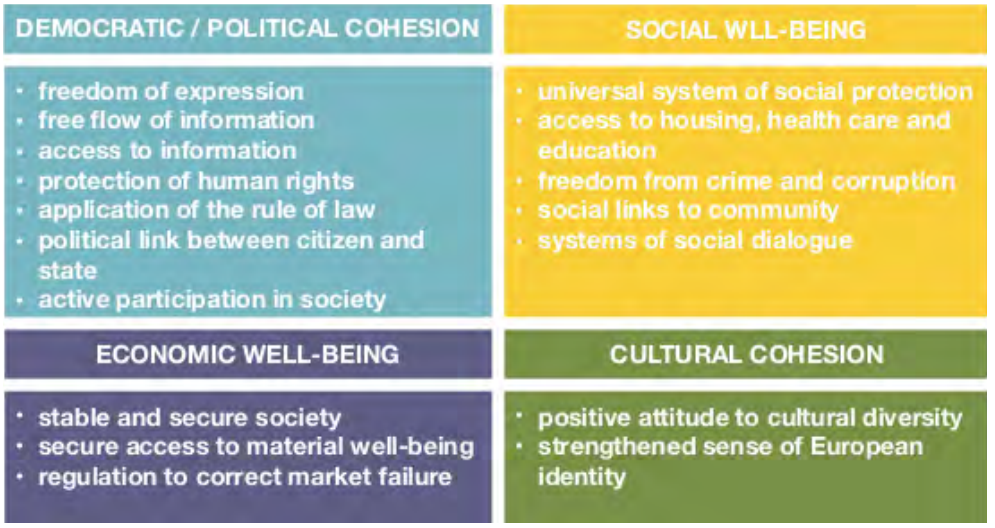


Fig. 1. Social cohesion indicators
Source: (Mahmud, Jahan, 2013)

Another identification of five dimensions of measuring social cohesion is presented by Beauvais and Jenson (2002):

- Belonging vs Isolation,
- Inclusion vs Exclusion,
- Participation vs Non-involvement,
- Recognition vs Rejection,
- Legitimacy vs Illegitimacy.

Those are the issues that members of multicultural cities are prone to during adapting to new living environment.

In the age of globalization multiculturalism becomes common feature for many coastal cities. Urban policy in that kind of places is a big challenge for city managers because of ethnic groups variety and their specific way of living, their diversify culture, needs and potential conflicts between different ethnic groups. F. Wong multicultural community need to be treated as an intercultural community "(...)where different groups engage each other with united purpose". It is important to take it into consideration making city policy (Wong, 1992: 45).

Spatial management and particular urban modules are considered to be parts of city policy in multicultural coastal cities. It has great influence on possibility for citizens to feel comfortable and safe in the city space. It could be an important indicator for integrating different cultures and see cohesive community living. In Baltic area there are about 50 regional languages and there is no one that could be a symbol of the "Baltic" identity (Rydén, 2002: 230), so urban policy could become a helpful issue in multicultural city management and identity feeling.

As Allor and Spence stated - today's urbanism is narrowly based on Euro-American guidelines (Allor, Spence, 2000: 11). In that way designers (excluding users) who represent different values of physical environment than Euro-American aboriginal society. In their opinion before planners are able to create multicultural well functional design modules, they need to undergo social-structural change. They assume that:

> "Ethnic and racial prejudice, whether intended or not, may never be fully addressed until people of different cultural backgrounds, representative of the community-at-large, share community decision-making in a political arrangement where all equal." (Allor, Spence, 2000: 202).

Buraydi stated, that there are three the most important institutions that should "(...) accommodate the needs of a multicultural society" (Buraydi, 2000: 11) the planning department of local government, local planning commissions and schools of planning. What is important in multicultural policy too? Development of the concept of multicultural urban communities as the effects of migration and protection heritage urban (even before the economic pressure and globalizing culture).

1.3. Multiculturalism in urban planning: culture of dialogue

For discussing multicultural cities horizontal and open perspectives are crucial. As it was mentioned before, introducing multicultural politics requires openness from both the authorities and citizens, assurance of the access to culture and societies. In what way multicultural character of the cities may influence the planning process? Multicultural policy is most of all policy of dialogue, co-administration with different subjects (public or non-public) on every stage of creating the cities. The openness and answering to the diverse needs (social, educational, economic, cultural) is very important facet of space planning. Planners seem to not recognize other nationalities or special needs. City space should not limit those who use different cultural code (foreigners, hearing impaired, visually impaired, other disabilities, holding other values, members of diverse social groups, subcultures). Without participation in the space planning process the goal cannot be acquired.

Using the idea of good management as a base and as a concept easing the choice of criteria of analysis. Good governance idea is a concept of management in public sector. Through "management"

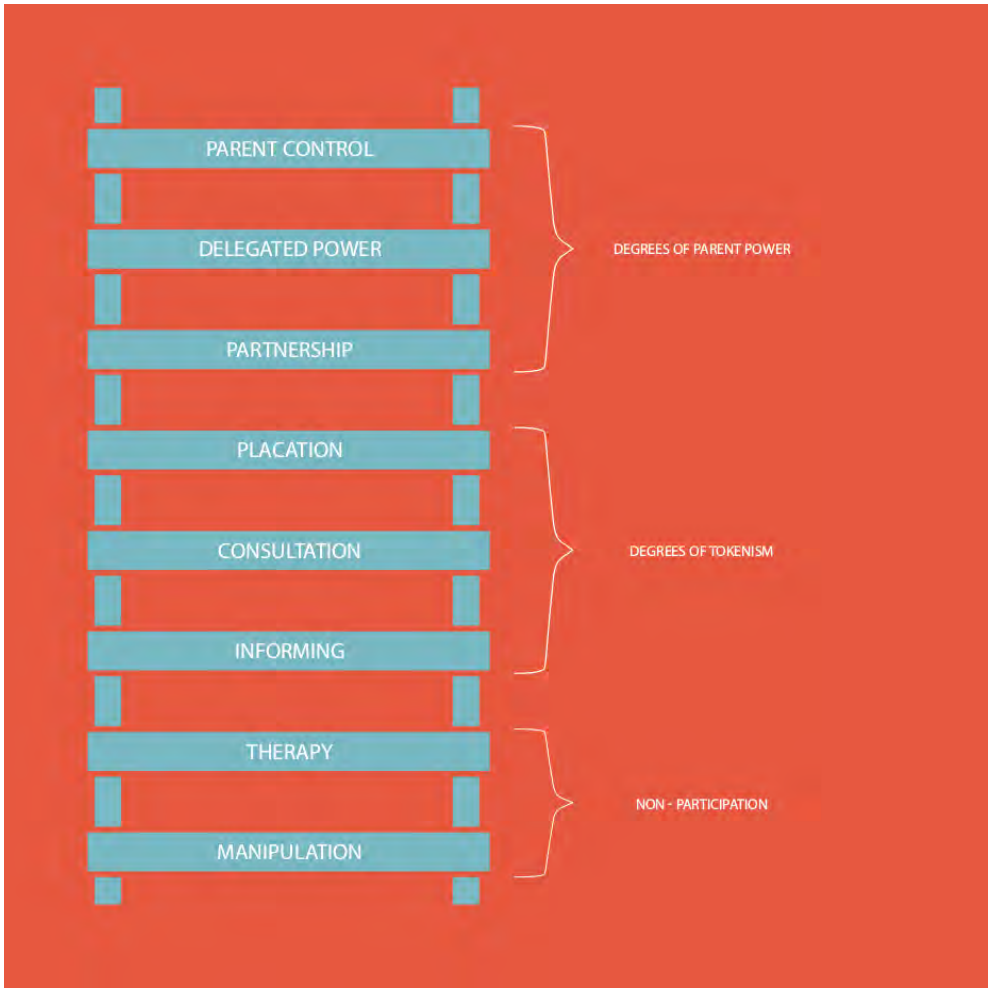
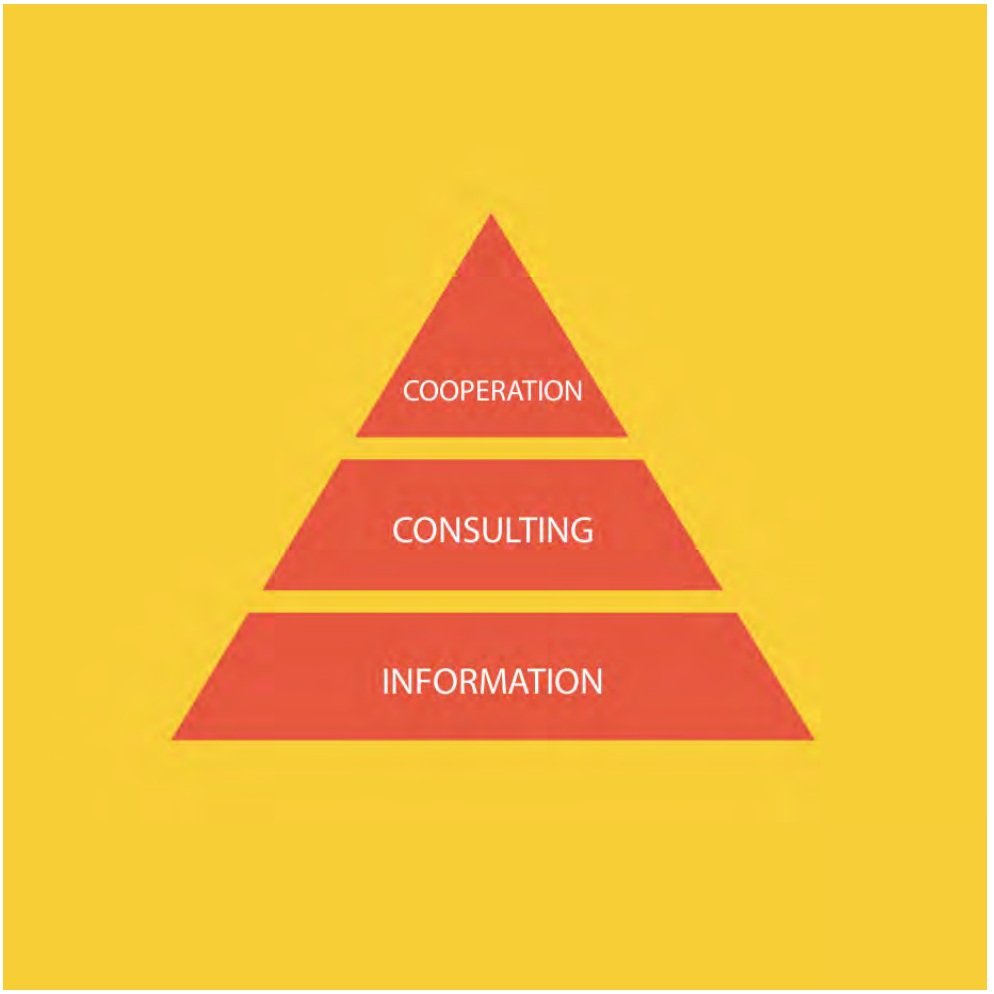


Fig. 2. Ladder of participation
Source: S.R. Arnstein (1969)

we understand the process of making and applying the certain decisions. Good governance means decision making and actions engaging all interested parties, rule of law, clearness, answering to the social needs, aiming for consensus, taking into consideration the voice of minorities, effectivity, but also broadly defined responsibility towards society. In Polish culture of the law, principles of good governance are rare. This idea give us criteria through which we can better understand conception (Ministry of regional development, 2008: 5-9):

- Participation – all members of the society (citizens) participate in the process of administration; participation can be direct or indirect (participation through representatives or institutions);
- Transparency – decision-making and implementation takes place according to determined rules and procedures; the information is apparent, conveyed in comprehensible way to those which it concerns;
- Rule of law – administration is based on and contained by law; the human rights are abided, particularly those of minorities; law obedience is executed by unbiased police force and independence courts;
- Answering to needs – the institutions cooperating in the process of management take into consideration the needs of all interested parties; the needs are met immediately (or as quickly

Fig. 3. Modern ladder of participation
Source: Partycypacja Publiczna krok po kroku – antologia tekstów Source: (Chrzanowski, 2014:10)



as possible) as they arise;

- Effectivity – the effects of the administrative answer to social needs, reached with the best – from the point of view sustainable development and natural environment protection – allocation of available resources;
- Consensus – the wide consensuses are worked out to answer up-to-date and future needs of the society as a whole corresponding to the multitude of actors of social life, points of view and individual or group affairs;
- Responsibility – public institutions, private sector and social organizations are responsible for their decisions and actions before the society, in particular before interested parties those actions affect;
- Equality and inclusion – all members of the society have the possibility of influencing (and the sense that they can influence) the process of management; in particular in the process of administration are included the individuals and groups politically and economically vulnerable.

Important criterion is participation. Participation is actively contributing, giving opinions in the matters concerning us. It can take different forms, depending on the level of commitment of the

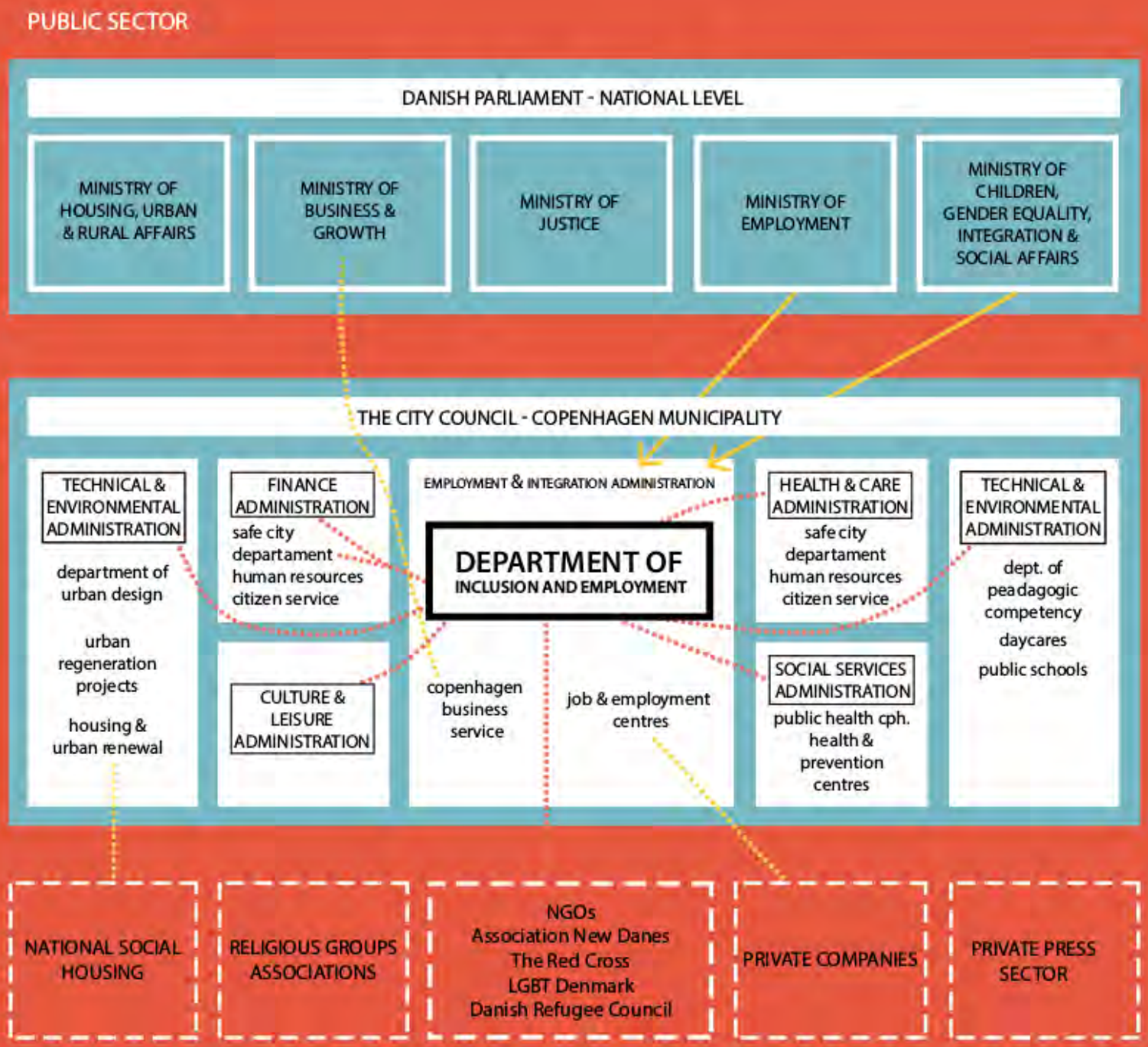

PUBLIC SECTOR
DANISH PARLIAMENT - NATIONAL LEVEL
MINISTRY OF HOUSING, URBAN & RURAL AFFAIRS
MINISTRY OF BUSINESS & GROWTH
MINISTRY OF JUSTICE
MINISTRY OF EMPLOYMENT
MINISTRY OF CHILDREN, GENDER EQUALITY, INTEGRATION & SOCIAL AFFAIRS
THE CITY COUNCIL - COPENHAGEN MUNICIPALITY
TECHNICAL & ENVIRONMENTAL ADMINISTRATION
department of urban design
urban regeneration projects
housing & urban renewal
FINANCE ADMINISTRATION
safe city
departament
human resources
citizen service
CULTURE & LEISURE ADMINISTRATION
EMPLOYMENT & INTEGRATION ADMINISTRATION
DEPARTMENT OF INCLUSION AND EMPLOYMENT
copenhagen business service
job & employment centres
HEALTH & CARE ADMINISTRATION
safe city
departament
human resources
citizen service
SOCIAL SERVICES ADMINISTRATION
public health cph.
health & prevention centres
TECHNICAL & ENVIRONMENTAL ADMINISTRATION
dept. of peadagogic competency
daycares
public schools
NATIONAL SOCIAL HOUSING
RELIGIOUS GROUPS ASSOCIATIONS
NGOs
Association New Danes
The Red Cross
LGBT Denmark
Danish Refugee Council
PRIVATE COMPANIES
PRIVATE PRESS SECTOR
NON-PUBLIC SECTOR

Fig. 4. Mapping of key institutions and organizations with influence on policies and discourses on diversity from national to municipal level
Source: (Andersen, Blach, 2014: 6)

authorities, citizens and passed rights. According to Arnstein – social participation of the citizens is social authority, which escalation takes on the form of a ladder, it is gradable process (Arnstein, 2012: 14-16). Through it we can observe the differences between citizens who possess the power or are excluded and differences between actual (official) and unreal (unofficial) actions. In 1969 first of the schematics was introduced, that relied on eight pillars: civil control, delegating of authorities, partnership, pacification, consultation, information, therapy and manipulation.

The elements that are not contained by the participation are manipulation and therapy. Those are the two illusive forms of cooperation with the citizens. Manipulation as front mechanism of engaging citizens began along with Urban Renewal movements, when citizens were invited to join Civil Advisory Committees (USA). The practice showed that the authorities educated the citizens not engaging in the dialogue but conveying planned information. Tokenism is a process where the citizens have the possibility of listening to the authorities and giving their opinion, although it is not a binding process. We can distinguish informing, consulting and pacification or co-deciding. The authorities give the citizens the role of advisors leaving decision-making for privileged groups. The highest staffs are those connected to real power of the citizens, those are partnership, delegating of authorities and civil control. Partnership is a process where both parties (the authorities and citizens) make decisions about shared responsibility, shared participation in planning and decision-making. Delegating of authorities occurs when the citizens become the authority, the experts and can not only make decisions but also enforce it. Civil control on the other hand means total, independent decision-making.

The commonly practiced ladder of participation used by us includes three elements:
- Cooperation;
- Consulting;
- Informations.

The lowest staff on the scale of engagement is lack of information or informing, meaning one-sided communication. The society is being persuaded into accepting decisions. The role of the authorities is reduced to informing the citizens of already made decisions (Chrzanowski, 2014: 11). The citizens are deprived of the possibility of participation; they are only passive observers of the reality. The role of the officials is implementation of the ideas. Sometimes the level of information is confused with consultation. It is the most frequent and diagnosed form of communication between the citizens and Polish authorities.

Consultations are the example of two-way communication, non-binding unfortunately. The citizens are asked for their opinion or information before the authorities make the decision, they become the advisors, the experts (Mierzejewski, Pietras, 200: 5-6). Local government is not obliged to take into consideration voiced opinions. Due to Polish law regulations this is the most frequently used form of participation in Poland. Sometimes the consultations become the tool of power games in the community. The process itself is composed of many stages. Giving most power to the citizens is the stage of co-deciding. Citizens not only can voice their opinion but realistically influence the decision-making process, thereby sharing the responsibility. Both parties define problems and goals together, elaborating the decisions based on consensus. The key role is fulfilled by two-way communication.

You can read below how important the communication and intersectoral participation in city administration processes is.

1.4. MULTICULTURALISM IN THE CITY: BALTIC CITIES CASE STUDY

1.4.1. COPENHAGEN, DENMARK CASE STUDY

As a case of multicultural policy in urban design in coastal cities it's important to pay attention to Copenhagen, which "(...) stands out as a pioneering municipality and a role-model for other municipalities with respect to diversity" (Andersen, Blach, 2014: 4). Copenhagen government treats diversity as an advantage for the city, but understands that creating coherent society in relation to diversity is a big challenge for them. Denmark as a country is relatively small (only 5 mln population). It consist of 5 regions and 98 municipalities. There is quite a short distance from national politics to local politics. The Copenhagen Municipality consists of politicians and local association representatives all in all 55 members that are elected for a four-year term. The group consist of politicians and local association representatives. The central administration of Copenhagen Municipality is the main decision maker and is not obliged to follow proposals by the local councils. The scheme of key institutions and organizations that are influencing policies and discourses on diversity from national to municipal level in Denmark is presented on the figure no. 4.

Public sector is influenced by Non-Governmental Organizations and private sector. For example social housing organizations (independent quasi-public sector) play important role for specific group of people who live in Copenhagen. They provide help economically and/or socially marginalized people (Andersen, Blach , 2014: 6).

Even today Copenhagen follows the idea of diverse city with cohesive multicultural society, in previous years debates about these issues were very conflicting among public and politics. Immigration and integration policies have been changing due to time and political parties being in power. Important date for these issue was in 2004, when European Union borders started to be internally open. Due to this fact immigrants annual rate in Denmark increased from about 3 200 in 2003 to 15 000 in 2012 (Andersen, Blach, 2014: 9). Hopefully governance of the city created urban preprogramms to meet expectations of new residents and hold society in cohesion and avoid social conflicts. As authors declare in the report "Diversity is embraced and seen both as a necessity and a strength for the city, crucial for both the international competitiveness and the social cohesion of the city" (Andersen, Blach, 2014: 10).

CENTRAL MUNICIPAL POLICIES ON DIVERSITY IN COPENHAGEN - EXAMPLES OF URBAN PROGRAMS

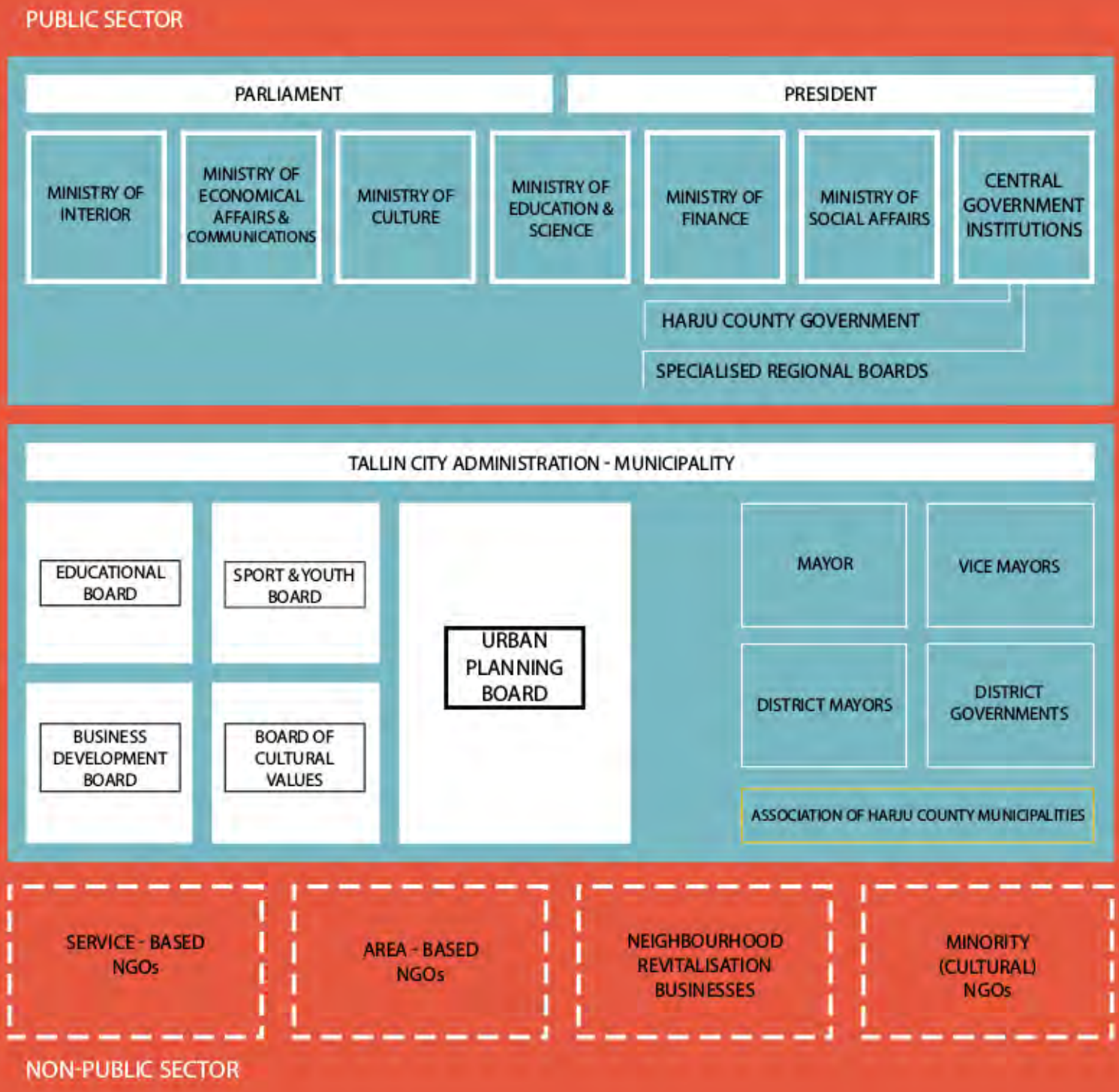
A. POLICY FOR DISADVANTAGED AREAS IN COPENHAGEN (2011)
This is area based project introduced in 2011 for stagnated and depredated districts. The aim of the programme was to raise the living standards in social and spatial areas (education, leisure time activities, physical maintenance, city live, social housing, safety) and lead them to average city level. It was achieved by preferential treatment and better cross-sector cooperation in the municipality.

B. GET INVOLVED IN YOUR CITY. CITIZENSHIP + INCLUSION (2010)
City-wide program of multidisciplinary integration policy for 2011-2014. It was established to create an image of Copenhagen as inclusive city focusing on citizenship and diversity. The aim of the programme was also to improve some socio-economic factors to diminish differences between people on that field. Three main concepts were introduced within the project:

- inclusion - developing the sense of belonging and being a part of the city among new citizens;
- integration - encouraging interaction between people of different backgrounds;
- citizenship - giving opportunities for all citizens to participate in the democracy in a responsible

Fig. 5-7. Superkilen
Source: www.miesarch.com

Fig. 8. The system of governance for managing urban diversities in the city of Tallinn
Source: (Tammaru, Leetmaa 2014, 2014: 5)


PUBLIC SECTOR
PARLIAMENT
PRESIDENT
MINISTRY OF INTERIOR
MINISTRY OF ECONOMICAL AFFAIRS & COMMUNICATIONS
MINISTRY OF CULTURE
MINISTRY OF EDUCATION & SCIENCE
MINISTRY OF FINANCE
MINISTRY OF SOCIAL AFFAIRS
CENTRAL GOVERNMENT INSTITUTIONS
HARJU COUNTY GOVERNMENT
SPECIALISED REGIONAL BOARDS
TALLIN CITY ADMINISTRATION - MUNICIPALITY
EDUCATIONAL BOARD
SPORT & YOUTH BOARD
URBAN PLANNING BOARD
BUSINESS DEVELOPMENT BOARD
BOARD OF CULTURAL VALUES
MAYOR
VICE MAYORS
DISTRICT MAYORS
DISTRICT GOVERNMENTS
ASSOCIATION OF HARJU COUNTY MUNICIPALITIES
SERVICE - BASED NGOs
AREA - BASED NGOs
NEIGHBOURHOOD REVITALISATION BUSINESSES
MINORITY (CULTURAL) NGOs
NON-PUBLIC SECTOR

and accommodating way
This program was focused on non-Western immigrants and refugees and the aim was to create good start in life for children and young adults, make a place for them on the labor market, support deprived people and area.

C. METROPOLIS FOR PEOPLE (2009)
The city-wide program focusing on creating public spaces for a diverse urban life in Copenhagen was started in 2009. Three main issues were indicated: more city life for all, more people walking more and more people staying longer in the public spaces. Guidelines for the physical urban design and city planning made by the city administration were aimed to reach program goals. One of the important aspects included in the program thesis was: "Public spaces in the city are where we interact with other people. A short chat on a bench or maybe just eye-contact and a smile enhances the quality of life and increases mutual tolerance and understanding" (Metropolis For People, 2009).

D. ACTION PLAN FOR THE INCLUSION POLICY (2011)
This program was oriented towards children. The aim was to strengthen diversity, integration and knowledge of language of immigrants and descendants. Program consists of indicatives including educational and social support in day-care centers and schools.

All of these programs were financed from the general budget: "(...) policies aiming to create spaces of encounter and spaces of democratic deliberation between groups; and policies for diversity and the recognition of multiple voices" (Andersen, Blach, 2014: 130). All of the Copenhagen programs and policies ides were great challenge for the city, no always reached, but the governance and NGO sector are going further to improve their ideas.

It is worth to present an urban project which could be treated as a materialized idea of Copenhagen multicultural diversity. "Superkilen" designed by Bjarke Ingels Group (BIG) is a kilometer - long city park located in the Nørrebro area. The project was made with respect to the district diversified society and in this district 60 nationalities could meet. It is considered to be multicultural symbolism. Designers used globally-found objects in order to symbolize all nationalities and make a space where people from all around the world could feel sense of belonging. Neon signs from Qatar and Russia, imposing sculpture of a bull from Spain, bollards from Ghana and Palestinian soil could be found there. All the plaza consist of three smaller parts, each in different color as well as materials: black, green and red. Because of interesting and well considered design, people from every social group and people of all ages can find a piece of space interesting for them and encouraging to spent time there. It can be a great example of multicultural diverse public space in the city, according to Jordana (2011).

1.4.2. TALLINN, ESTONIA CASE STUDY

In Tallinn about half of the population represent Ethnic minorities – that is rather high level (in comparison to other east European cities). But as it could be seen from the policy documents the diversity issue is not so important for Tallinn administration if compare to Copenhagen (Tammaru, Leetmaa, 2014:4). The political structure in the country is also different, all country of Estonia consist of 215 municipalities, which are dependent on the central government (the bigger municipality is the more independent it is). According to the political structure, Tallinn consist of the upper-city (Parliament and the Prime Minister's office on Toompea Hill) and the lower-city: here the city as a municipality is governed. Both, public and NGO sector are important in Tallinn governmental structure. Scheme of the system of governance for managing urban diversities in the city is presented on the figure no. 8.

Tallinn city, which is divided into 8 smaller districts, is governed by 13 specialized boards (parts of Tallinn City Council and Tallinn City Government).
In the urban planning policy business and some of Tallinn NGO's have an influence on city spatial and economical development. Creative City (TCC) in northern Tallinn is an interesting example of theses two sectors cooperation.

This is a completely privately-owned umbrella organization that hosts various creative enterprises in its premises, together with some still-functioning traditional industrial enterprises. TCC aims to bring together a diverse set of activities and, thus people from all over the city who both work and spend their leisure time here: (Tammaru, Leetmaa, 2014: 26). In housing sector more than 90 percent accommodations are private. It caused moving from master planed framework to developmental framework in urban planning (Golubchikov, Phelps, 2011). It follows by fragmentation of the city and micro-scale diversification of the housing stock (Temelova, 2011). This situation has influenced on increases intra-neighborhood diversity. It also leads to local society homogenization.

The idea of multicultural society is quite young in Estonia, from 2000 its government puts attention to create multicultural society with strong state identity. In report it is indicated that: "Estonia as a socially cohesive society with equality of opportunity for everyone" (Tammaru, Leetmaa, 2014: 8). However, there are no programs or policies directed only on multiculturalism. In "Estonian integration strategy 2008– 2013" the the main focus was put on integrating minorities and increasing sense of citizenship by increasing proficiency of Estonian language knowledge towards children, qualification of teachers and teaching materials.

> "The process of integration of the population of Estonia is a long-term one and its ultimate goal is a culturally diverse society with a strong Estonian state identity, sharing common democratic values in which, in the public sector, permanent residents communicate in Estonian." (Tammaru, Leetmaa, 2014: 10)

Currently consulted plan "Estonian integration strategy 2014–2020" focuses more on creating social cohesive community in which everyone has equal opportunity for social mobility. Regardless the whole descriptive part explaining ideology, it seems that Estonian multicultural policy is based on distributing funds towards NGO's to realize theirs programs targeted on integrating society.

Estonian integration strategy or development plan for disabled are focused on social cohesion. Development Plan of Primary and Secondary Schools in Tallinn or Development Plan of Public Children Playgrounds in Tallinn could be considered as policies "to create spaces of encounter and spaces of democratic deliberation between groups". General documents like "Tallinn Development Plan" or "The Public Transport Development Plan" also have parts related to social cohesion (Tammaru, Leetmaa, 2014: 12). Looking to more specific city intervention to urban design modules for multiculturalism it is worth to present the House for Minorities in the Pelgulinna neighborhood - in Northern Tallinn, where 68 different minority groups could meet - or Orthodox church build in the largest Soviet-era housing estate area Lasnamäe (Tammaru, Leetmaa, 2014: 15).

Tallinn city governance treats residential neighborhoods as important places of mixing and encounter in urban city model. As Tammaru, Leetmaa, says

> "(...) the policy debates in Tallinn demonstrate that it is not a good idea to isolate one effect from the other, for they are simply too strongly linked to each other, and they have to be therefore addressed together." (Tammaru, Leetmaa, 2014: 18)

Diversity through-mixing ideas could be found in policy document like "Tallinn Strategy 2010–2030" (Tammaru, Leetmaa, 2014: 13). By Master Plans development of the urban space in respect to social mixing and cohesion are planned on city and district level. Authors emphasize, that

> "[...] diversity in Tallinn is often seen in instrumental terms by emphasizing the attractiveness of Tallinn for various actors, including city dwellers, potential in-migrants, tourists and entrepreneurs"

(Tammaru, Leetmaa, 2014: 18). Based on information in document "Tallinn Strategy 2010–2030", diversifying the city according to multiculturalism is a plan for the future, not a current priority. Government can see, governance can indicate Governance can indicate flexible housing policy, more diverse services with higher quality and an urban space of human scale and with many choices as an important indicator to avoid social and ethnic segregation and to give possibility for cohesive multicultural society development (Tammaru, Leetmaa, 2014: 19). Better public transport connections and city decentralization are also essential points in city development strategy in relation to multicultural cohesive society.

1.4.3. CONCLUSIONS

Comparing multicultural policy in urban design modules, in two different Baltic coastal cities shows how strong influence on the country, city and people has the history. In Copenhagen, representing Western Europe (Denmark is a member of European Union from 1973), multicultural policy with emphasis on city diversity is the key point. In comparison in Tallinn, a capital city of one of the countries that under Soviet Union control - until 1980 - and is a young EU member - from 2003 - mentioned in chapter 1.4.2 ideas are developing as secondary policy issues. Scandinavian metropolis is implementing precise urban and social programs to create real well working diverse multicultural city, when Tallinn is mostly describing that activities in strategy documents. But both examples shows that developing balanced multicultural city is a process which need to be take into consideration in every city policy field and level according to time. All these interesting and useful proposals, solutions and strategies of multicultural policy in urban design modules could be very useful for other cities like developing multicultural coastal Gdansk and Gdynia.

2. RESEARCH METHODS

The goal of this article is the analysis of the multiculturalism of the seaside cities (Gdansk and Gdynia). The analysis is conducted in three areas: cultural, social and architectural. The aim is to distinguish the differences and similarities in culture of urban planning management. The purpose is to find good practices, elements of multicultural policies in cities under consideration and defining its character – whether they may be called multicultural cities, are they met the appointed criteria, are they open (in the administration area), can the local authorities meet the requirements of the multicultural policies and how can it be applied to citizens- and tourists-oriented actions.

Considering how broad the issue of multicultural cities, several research methods were chosen that allowed to studying the questions of interest. The process of management of the cities itself (not only in the planning department) engages many actors – the representatives of all sectors (government, NGO, business) and the citizens. These actors represent groups that are interested and involved in the participation process, from consultation involving strategic documents or investments to consultations on the development of the yards, size of the fees for extracurricular activities in kindergartens or organization of cultural events. That is the reason behind choosing four research methods.

Fig. 9. Behavioural mapping observation spots Gdynia - satellite map
Source: Google Maps

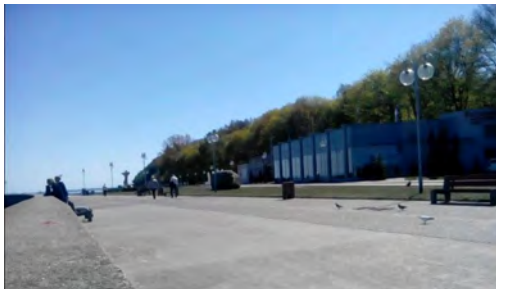


Fig. 10. Behavioural mapping observation spots Gdynia - view
Source: by K. Kupczyk

2.1. DESK RESEARCH

Desk research is kind of method, where we do analysis of data from secondary sources of information (for example: scientific press, documents, reports, statistical data, literature, etc.) - the use of information that were originally designed for other purpose (Babbie, 2003: 341-343). The analysis was applied mostly during determination of the historical background of both cities – Gdansk and Gdynia and while determining the indicators of multiculturalism. The study of the literature on historical background was based on the following criteria:

- The process of creation of the cities with consideration of the important historical events that influenced the shape and structure of the cities;
- Architectural and urban elements connecting the cities to the sea;
- Multicultural aspect of the cities in approach:
  - architectural – places that refer to multiculturalism: connected with ethnic or national minorities, those that show religious difference (sacral buildings of other religions), with their style and form alluding to other cultures or places where different cultures meet, that are connected with different cultural codes, symbols;
  - cultural – cultural events promoting other cultures, open events.

2.2. INDEX OF PARTICIPATION

Because we speak of multicultural cities as cities open also in the terms of the management we used the tool called index of participation. The index is a research method used to measure the phenomena of social. Index is a synthetic recognition of a few or several different indicators describing the same phenomenon in its various dimensions (Zimny, 2000: 14). The index is a tool developed on the base of the document **„Seven rules of participation - implementation path, Ministry of Administration and Digitalization".** It contains all elements resulting from the definition of good practices and mentioned in the first chapter good governance criteria. This tool eases the diagnosis of participatory democracy in the cities. It is possible to check through it on which level of the decision-making process is the city on, whether the local authorities abide the law, of which decisions the citizens are informed and which are co-executed. For this project we analyzed mostly the decisions involving space management. Through the index we can

Fig. 11. Behavioural mapping observation spots Gdansk - satellite map
Source: Google Maps

Fig. 12. Behavioural mapping observation spots Gdansk- view,
Source: by P. Wróbel

differentiate three levels of governance:

- Level of information, it determines what decisions are conveyed to the public. The areas are determined by law and involve local development plan, strategic documents or programs of cooperation with NGO's (those are the minimal indicators) and those are the areas in which the information for the citizens is dictated by good will of the authorities. It contains for example information of the decisions changing the traffic, closing of educational establishment or construction planning. On this level the manner of information is decided, whether it includes traditional channels like internet site or Public Information Bulletin or informational meetings, posters, flyers, debates etc. with particular consideration of transparency of the authorities.
- Level of consultation, is grasped by the indicators of respective elements of the process: preparation/planning of the consultation, education and information, the topic of the consultation, realization, feedback, evaluation and application of the remarks. Minimal indicators are determined by the law, for example mandatory consultation of Local Development Plan, or by good practices, for example access to the process for everyone, according to the rule of equality of chances, publishing the reports with explanation of accepting or rejecting the remarks.
- Level of cooperation, contains the tools for motivating the citizens and growing cooperation with the authorities. those tools teach the citizens co-administration of the district and enables participation in realization distinctive tasks, for example building of the playground on the estate and control of the tidiness on the premises.

2.3. SELF-COMPLETION QUESTIONNAIRE

Questionnaire is an instrument from the field of sociology or psychology, it is a quantitative research method. The survey is a form containing a set of logically ordered questions presented in the form of printed paper or in electronic form, filed by respondent without the help of the interviewer.

Survey with open-ended and closed-ended questions was prepared and distributed between urban planners from Gdansk and Gdynia. In the research the mail survey was used. It was sent to 15 respondents, and 10 answers were gathered. The questionnaire consisted of 11 questions. Each of them referred either to the city planners everyday professional practices either theirs personal vision of Gdansk and Gdynia development. The survey is based on the vision of cooperation between urban planners and citizens and building together friendly space and managing it according to standards of good governance formulated in eco-cultural framework.

2.4. BEHAVIOURAL MAPPING

The pioneers of behavioural mapping were environmental psychologists, mostly Ittelson, Rivlin and Proshansky. They define mapping as

> „a technique for studying the relationships between behaviour and the physical space in which it occurs"

(Gifford, 2016). First studies were conducted in the late 60's of 20th century. The data was marked manually with the use of pencil and a piece of paper. Over time the technique has been perfected, nowadays researchers use not only traditional methods but also digital ones as movies, pictures and GIS maps. Behavioural mapping is one of the non participant observation methods allowing to study human behaviour in their natural environment in repeated time periods. It premises distanced attitude of the researcher not interfering with the environment and people under investigation, which allows observation of the social phenomenon occurring in purest form. It also allows the exclusion of incomplete responses given to the question about activity conducted in researched area resulting from unawareness of those activities, forgetfulness or knowledge of the

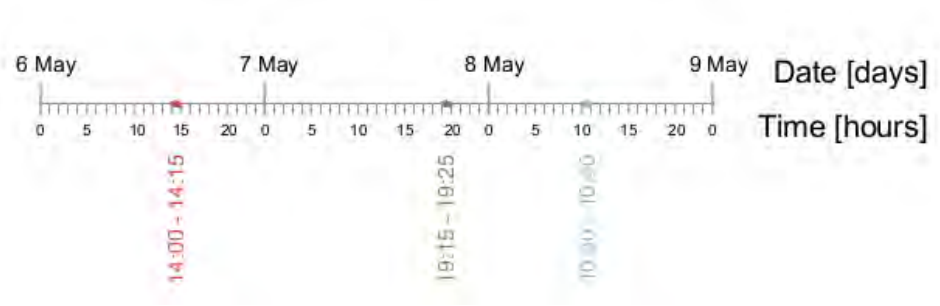


Fig. 13. Hours and dates of behavioural mapping observation
Source: by K. Kupczyk

illegal character of those activities. The result of the observation and data for further analysis is a map of behaviours reflecting respective kinds of activities, number of people conducting it and its placement over the area (Gifford, 2016; Bozkurt, 2016).

We can distinguished two kinds of mapping:

- place-centered mapping – concentrated on researching of given a space, for example Playground ;
- individual-centered mapping – concentrated on researching of behaviour of the group with reference to place and time, for example sort of activities of the senior citizens group in a small town.

Mapping of activities is mostly used for elaboration of the functional and special programs, post occupancy evaluations and behavioural research.

In our research behavioural mapping was used as a verification tool whether the assumptions concluded in local development plan respond to citizen's needs. The basic goal was to verify whether the fiat of the city planners and the authorities correlate with the needs of the society and if implementation will amplify the intensity of usage over chosen locations.

First step was to select localizations of the observation in Gdansk and Gdynia. Few potential places were singled out, all of which were not only characteristic space in the city but also were tourists attractions spacewise becoming places of potential meeting of different cultures. They were supposed to be inclusive and open for all users. During the choice of the places we searched for localizations with similar spatial character.

We created a chart with following criteria for exact comparison of the character of chosen areas:

- identity (questions):
  - Does the place have a name?; from how long? did it change often?
  - For how long the place was existing; history; is it meaningful for citizens?
  - Does this place, and its surroundings have some particular characteristic elements (for example: details, materials)
  - Does it seems more like border, region, hub or orientation point?
  - Who lives there (assumption)?
- shape & human scale:
  - open or with defined borders;
  - proportions of the space (take into consideration human scale);
  - openings, closings of views;
  - square, plaza, street, with dominants or without;
  - the width of pavements, its technical condition;
  - does it have "soft borders", places to sit, stand, observe others;

Fig. 14-15. View to Gdynia in the 20s.
Source (14): http://fotopolska.eu/foto/805/805302.jpg
Source (15): http://gdynia.fotopolska.eu/715428,foto.html

- functions:
  - leading function of a place
  - supplementary functions: functions of surrounding buildings: housing new/old; multifamily/ single; public usage; business buildings, small shops, shopping malls, services building, public administration, gastronomy etc.
  - What are the supplementary functions? Local / everyday usage (kindergarten, primary school, junior high school - if there are near nor bakery, greengrocers, pharmacy, restaurant etc.) above local (museums, shopping malls, cinemas etc. Include also vanishing professions like clockmaker, shoemaker etc.)
  - Greenery (type, percentage of coverage, type [small, big, decoration, recreation])
- location:
  - Distance to the city main station, bus station, airport, harbour
  - Distance to the sea
  - How is it connected to the other parts of the city (buses, trams, SKM); public transport stops and parking lots nearby
- other remarks - not listed.

For the convergence in character of the localization concluded from aforementioned criteria two localization were chosen for the research: pier in Brzeźno (Gdansk) and seafront in Gdynia. Moreover one of the most recognizable elements of the seaside cities is their shoreline with its life. In both Gdansk and Gdynia the probability of meeting people of different than Polish cultures was in the vicinity of the beach. It is obvious consequence of tourist attractiveness of those localizations which makes them the places where cultures meet. At the same they are large fragments of open space open for everyone. Observed area was 100x100 m. following scheme represents the hours and days of the observation conducted for both Gdansk and Gdynia simultaneously. In each place researchers made a movie that was analysed in detail. The results were widely portrayed in next part.

Fig. 16. Old Postcard , author unknown
Source: www.oldstratforduponavon.com/gdansk.html

Fig. 17. Handling bridges
Source: www.portgdansk.pl

Fig. 18. Entry to the Gdansk's Harbour in 1920s
Source: www.portgdansk.pl

3. CULTURE OF URBAN PLANNING MANAGEMENT IN GDANSK AND GDYNIA

3.1. HISTORICAL BACKGROUND GDYNIA

"City from sea and dreams..."

This particular quote is repeated in every elaboration about Gdynia's history and it is a perfect place to start telling a story about this city.

3.1.1. CONNECTION WITH THE SEA

The story of shaping of the Polish relationship with the sea is all the more fascinating as Poland was not really a country with maritime tradition. In early modern times Poland's access to the sea was possible thanks to the harbor in Gdansk, yet the city at the time within the boundary of the state, did not really integrate with its other regions.
In 1918, after 150 years of partitions, Poland regained its independence. Rapid development of the country was not possible as long as Poland was lacking direct access to the sea. It was only on 10th February 1920 that nuptials (a symbolic act meaning union of a country with the sea) of Poland with the Baltic Sea could be performed in Puck. It was, Under the Treaty of Versailles from 28th of June 1919, a small portion of the Baltic coast was granted to Poland (Sejm, 1919: 24), (City Hall of Gdynia, 2016).

3.1.2. REASONS FOR FOUNDING THE SETTLEMENT

After regaining long awaited access to the sea, it was time to take action and to start to build Polish sea power. Engineer Tadeusz Wenda was sent by the Maritime Affairs Department of the Ministry of Defence, to go to Pomerania and search for the most suitable place to construct a naval port. His quest finished with a report that stated: "(...) the most suitable site for the construction of a naval port is Gdynia or, putting it more accurately, the plain between Gdynia and Oksywie, 16 kilometers from Gdansk's New Port."

Engineer Wenda advocated his decision with seven points prooving incontrovertible advantages of the site (City Hall of Gdynia, 2016):

1. "It is sheltered by the Hel Peninsula from those winds which Gdansk is not free from (from 21' NE to 54'20" NE).
2. Deep waters are close to the coast, the 6-metre depth line being 400 meters from the coast, and that marking 10-metre depth is between 1300-1500 meters from the coast.
3. The coast is low, being only 1 to 3 meters in elevation above the sea level.
4. There is plenty of fresh water available thanks to "Chylonja" brook.
5. The Gdynia railway station is located nearby (at a distance of 2 kilometers).
6. The holding ground on the roadstead is of good quality."

Mr Wenda not only presented a proposal of the port location, but he also designed it and was appointed the construction manager of the port. It was in spring of 1921 that the first piles were driven to construct what was termed as the "temporary naval port and fishermen's haven", and already in the autumn of the same year a daring idea of a great, versatile (commercial, fishing and naval) "national" port with transshipments reaching a minimum of 6 million tonnes annually was presented by Tadeusz Wenda. The main reason of founding the city of Gdynia was building a port that would serve the whole country and would be a gate to foreign trade, travels.

3.1.3. NATIONAL SIGNIFICANCE OF THE PORT

The adoption of the Act of 23 September 1922 on the construction of the port of Gdynia by the Polish Parliament is considered the formal beginning of the port of Gdynia. Eugeniusz Kwiatkowski, a chemical engineer by profession and politician by passion, added the political dimension to the engineering thought of Tadeusz Wenda and raised it to the status of a national investment. Eugeniusz Kwiatkowski was a minister of industry and trade in the years 1926-30. Being a politician, he was gifted with a special talent. He was also a publicist, a talent which he used, among other things, to popularize the matters of Gdynia. He would persuade skeptics to follow the idea of Poland as a seafaring nation. He would infect people with his passion and zeal. He would impress and move them with unselfishness and patriotism.

The construction of the port of Gdynia, a project of national importance, paid for itself even before the beginning of World War II, while having played the role of catalyst for social energy and patriotism. It was also thanks to Gdynia that Poles started believing they could achieve their wildest dreams and face the most ambitious challenges of the 20th century.

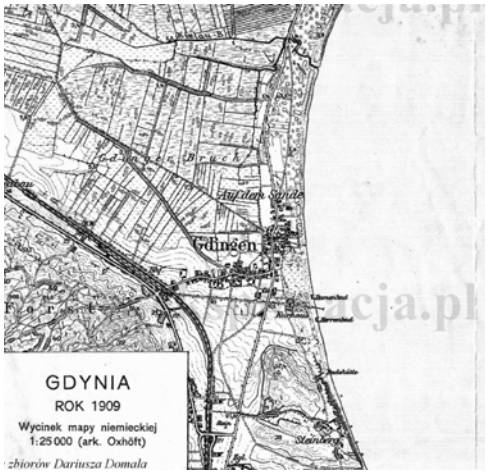


Fig. 19. View to Gdynia in the 20s
Source: http://gdynia.fotopolska.eu/715428,foto.html

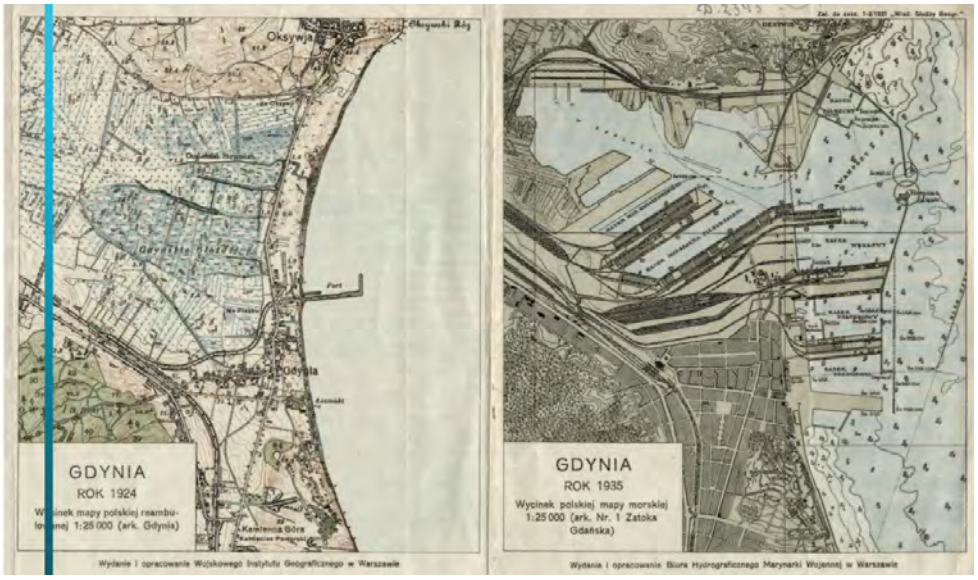


Fig. 20. Maps from 1924 and 1935 presenting the development of the Gdynias harbour
Source: http://gdynia.fotopolska.eu/

3.1.4. PORTRAIT OF CITIZENS

Gdynia was made from passion, initiative and dynamism. Those are main characteristics of many people following the idea building a new and better life. The city from its very beginning is a kind host for entrepreneurs, such as brothers: Robert and Franciszek Wilke. They founded a firm in 1931, in the summer. They started taking tourists for trips on board an old fishing smack. They treated this activity marginally but pretty soon, however, their idea took on the more mature shape of the firm called: Robert Wilke - Passenger Motorboats. The old fishing smack was soon sold and replaced by a better range of motorboats built in the Gdansk's Shipyard.

3.1.5. WORLD WAR II

The rapid growth of Gdynia in the 15-year period starting from 1926 was dramatically hampered

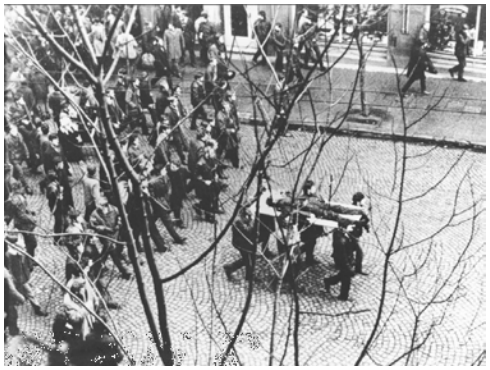


Fig. 21. Strikes on the coast in 1970
Source: http://dzieje.pl/sites/default/files/aktualnosci/gdynia_grudzien.jpg

by the outbreak of World War II. The city did not suffer much from bombardment, especially when compared with Warsaw or Gdansk, but the harbor and shipyard were completely destroyed. The inhabitants suffered, they were expelled by Germans or sent to concentration camps, many were killed at the fronts.

The survivors would quickly start coming back to the city, which was liberated in March 1945. Along with native inhabitants of Gdynia people from Warsaw, Lvov and Vilnius, having lost everything and looking for a place to set up a home of their own and just as earlier Gdynia was again viewed as a Promised Land. The post-war era once again became the pioneering time.

3.1.6. DECEMBER 1970

It became the unfortunate lot of the post-war generation to witness the tragedy of the bloody events of December 1970, when the shipyard workers of Gdynia, just like their colleagues from Gdansk took - on behalf of the whole nation - the rebellion against the government of the People's (only by name) Republic of Poland.

Today Gdynia has more than 250,000 inhabitants and is an important center of naval economy, international trade, science and academic education, culture and tourism. It is frequently cited as a city of success, a city in which people of initiative, entrepreneurial spirit, active and daring ones dwell.

Fig. 22. Old Poscard, author unknown, Source: http://www.castlesofpoland.com/prusy

3.2. HISTORICAL BACKGROUND GDANSK

From the very beginning Gdansk had a really strong connection to water. Founded between Vistula and Motlawa rivers and Baltic Sea, the City had and still has excellent conditions for development.

Gdansk was founded near the Vistula river as a fishing village approximately in 997. Its attractive location led to rapid development of trade with Germany and Scandinavia in 11-12th century. In the 12 and 13th century Gdansk was growing along river and Dluga Street. It became formally a city in 1224. Despite the takeover of Gdansk by Teutonic Knights in 1308 and other huge political and military changes, the city became the leader in Pomerania region. It was Polish city again from 1454. Three years later is got a „Great Privilege"- shipping through Vistula from Poland, Lithuania and Belarus was now possible without any control. In 1577 Stefan Batory confirmed Gdansk as a multi-religious city. This privilege caused a massive immigration because there were only a few places like Gdansk at that time. „Golden Ages" ended in 1655 with Swedish Invasion. The army attacked Poland to take control of the whole Baltic Sea. In 1600 both sides decided to make peace. In 1772 Prussia took over a New Port and gained a connection to Gdansk from both sides - land and water. In 1793 the city became a part of Prussia. The city has been besieged and repossessed from Prussia by the French-Polish army in 1807. Until 1814 Gdansk functioned as a free city, to finally return under the domination of Prussia in 1814. After some time after the great flooding in 1829, Gdansk started to rise again to improve its infrastructure. A few railway connections, shipyards and industries were made. Also new sewage and water supply systems were implemented. In 1920 Gdansk became a free city again.

When Second World War started, Gdansk has been defended heroically. The city was destroyed by bombing and fires in 1945. Almost 90% of buildings disappeared then. Authority in Poland was taken by the Polish United Workers' Party then. The strike in shipyard in 1970 began the battle with communism in Eastern Europe.

3.2.1. HARBOURS

First harbour was founded on Motlawa river in 10th century. When the village became a city, a new port on Motlawa had to appear. After that a harbor for the Main City was built with a lot of storehouses and workshops. The significant thrive of Gdansk is falling to the postage to the second-half of the 14th century and for the next century. Since then a scope of trade relations with overseas countries started widening quickly - Denmark, Sweden, Flandria, England, France, Spain and Portugal. At the end of the 16th century Gdansk ships were arriving also to Italy.

In the 17th century population of Gdansk was 75 000 residents. It was more than in Nuernberg and in Hamburg at that time. A development of the port corresponded to successfully developing economic relations. The first basic export article of the Gdansk's port was wood. In the 15th century the export of the cereal crop started to grow. Its biggest bloom is said to be from the second half of 16th century and for the beginning of the 17th. From the half of the 17th century, as a result of continuous wars and the economic fall, the export of the cereal crop dwindled. Amongst export articles in this period to exchange were: flax, hemp, feathers and linen. From 15th to 18th century, the Gdansk's Port played large role as the intermediary between the east and the west, being one of the most serious links in the contemporary international trade. At the Baltic Sea only Luebeck was a major competitor for Gdansk. A slow decline in the trade took place from the second half of the 18th century. It was caused by wars and political changes. From the beginning of the 19th century Gdansk belonged to Prussia and happened one from numerous already on the Baltic of German ports. The center of the international trade moved at that time more towards the Atlantic Ocean and ports closer to its location. In 1945 port became Polish again and consecutive years are a period of the reconstruction from the war damages. In 1950s a modernization of loading berths and a reconstruction of the harbor canal were commenced. In 1970s a North Port came into existence with terminals for the transshipment of fuels and coal. After putting this huge investment into operation global trans-shipments of the Gdansk port achieved the record-breaking numbers.

After the Second World War, Gdansk started growing towards water. No longer the river was only a symbol of the development. Along with the development of the North Port and the Gdansk Shipyard nearby areas became populated. From the initiative of municipal authorities, a long way from the center, new flats were built for poorer city dwellers. Numerous working classes housing estates started also coming into existence there.

Fig. 23. Builders of Gdynia from the right:
Engineer Tadeusz Wenda -
creator of a project and builder of port of Gdynia
Julian Rummel -
naval vessel construc on engineer, pioneer of the idea of Gdynia, director of Polish Sailing
Franciszek Sokół - president of Gdynia
Eugeniusz Kwiatkowski -
Minister of Industry and Commerce (1926),
Prime Minister of Poland's last government, before the outbreak of World War II, Minister of National Treasure
Jerzy Muller - architect of modernism style
Source: by A. Chromiec

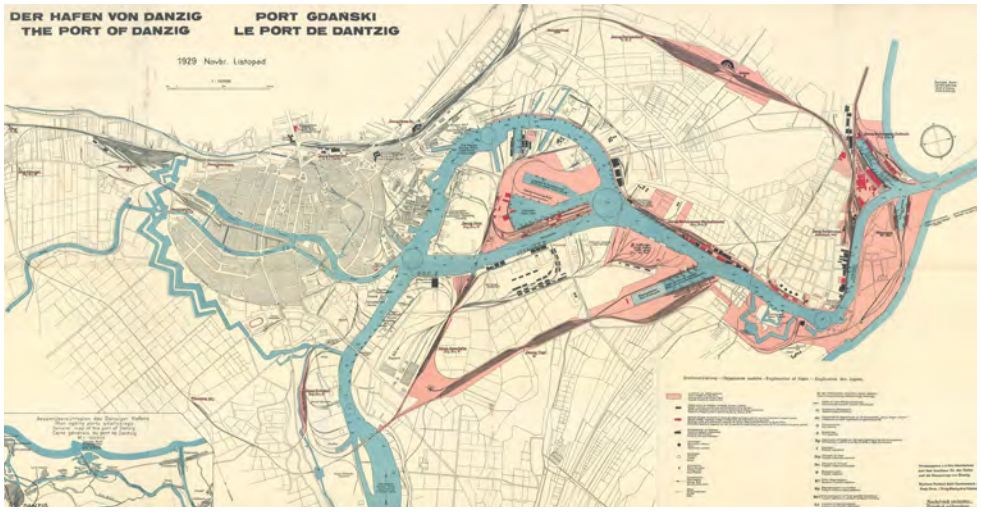


Fig. 24. Harbour plan from 1929
Source: www.mapywig.org/m/City_plans/Central_Europe/

Fig. 25. Gdansk Jelitkowo
Source: http://historia.skarbykaszub.pl

Fig. 26. Gdansk Jelitkowo
Source: www.trojmiasto.pl, by M. Kosycarz, 2013

Fig. 27.Gdansk, Main Town
Source: www.trojmiasto.pl, by J. Knera

3.2.2. WATER VS. TOURISM

At present, as similarly as in Gdynia, the sea trade and the tourism aim in good direction.
Both for residents, as well as tourists, the sea became not only a mean of transport, but also very important component of the recreation (Prezydent Miasta Gdanska, 2007: 18, 61). Today, the coast of the Baltic Sea is one of the most attractive pieces of Poland. Every year thousands of tourists arrive to Gdansk in order to sunbathe on many beaches. The sea also attracts investors. The majority of coastline is already build-up, but a green zone excluded from the building development is still separating water from buildings. It is planned to invest in this area (Prezydent Miasta Gdanska, 2007: 256)

3.2.3. EVERYDAY LIFE IN GDANSK

The population of Gdansk is getting older. Because of the high prices, young people decide to live outside the city and they come to Gdansk just to work. Many flats in the center of the city are bought out by rich people from other cities, or foreigners. Some houses remain completely empty during the winter, especially those that are located near the water. Since there are a lot of good Universities in Gdansk, there are a lot of students around. The city has a quite good public transport and it's well connected with the other parts of the world due to setting new infrastructure and maintaining the old one, which includes an airport. New housing estates and retail parks are being built. Areas all over the Gdansk Shipyard and waterfront are waiting to be reconsidered as the part of the city that is used by its citizens on a daily basis.

3.3. MULTICULTURALISM IN THE CITIES

Gdansk and Gdynia are rich in buildings and architectural structures that are representing the approach of various times, needs and cultures (Sas-Bojarska, Walewska, 2013: 132). It all started in the past when social hierarchy was more visible. Buildings that were inhabited by the poor are now transformed to provide the basic infrastructure for their contemporary owners. The form of the building, on the other hand, is still not identified as a one with parameters that are representing above average quality. The diversity in styles is even more visible with sacral buildings that are also extraordinary landmarks in both: Gdansk and Gdynia. There are still areas that are inhabited by different nationalities that appeared there due to the process of relocation. Nowadays multiculturalism that is visible in space and architecture is growing due to new trends such as gated communities and other notions.

More and more cultural events are set in Gdansk and Gdynia. Some of them attract tourists that are interested in local art. Other ones present heritage of non-indigenous cultures. The variety is very wide: from dance competitions to poetry reading and regional food tasting. The most visible aspect of multiculturalism in social context is the difference between tourists and citizens. It's not only about foreign language and different purposes. It's about the lifestyle. Some districts of Gdansk and Gdynia are very specific in the awareness of the citizens. There is certain image of these districts and people that live there. There is a visible difference between them and their neighbors (Majer, 2010: 243). Foreign corporations start to locate their headquarters in the region of Gdansk and Gdynia, so new dwellers come from other countries - their culture varies too.

Due to the national census from the year 2012 commissioned by Polish Ministry of Internal Affairs and Administration, 9 national (Belarusians, Czechs, Lithuanians, Germans, Armenians, Russians, Slovaks, Ukrainians and Jews) and 4 ethnic (Crimean Karaites, Lemkos, Romani and Tatars) minorities live in Poland. They are visible also in Gdansk and Gdynia. Due to the overall number of citizens of

each city, their activity is visible mostly in Gdansk. They group in associations, organizations and unions to care about and promote their culture through gathering, mass media, newspapers and cultural events.

On the 30th of June 2016 the Council of the city of Gdansk adopted the local law setting the Model of Integration of the Immigrants. The document consisted among other of: diagnosis, the most important values and rules, vision, aims, larger scale actions, tasks, implementing method, results and good practice examples. The collected data shows, that there are almost 5 thousands of immigrants and more than 3 thousands of foreigners registered in the city. The overall number is estimated to be around 15 thousands of immigrants - including those that are not registered anywhere due to visas or being a citizen of another European Union's country (Rada Miasta Gdańska: 2016).

The emergence to set such a document was caused by the need of integration immigrants that currently live in Gdansk. The number of them is expected to increase. Not only the direction of social policy for the future is shown in the document. The part that consists of the methods of implementing actual solutions for current issues was the initial aim. The problematic issues such as: accessibility to programs of institutions and healthcare, education of immigrants, equality among neighbours, integration with them, social assistance, violence, discrimination, stereotypes, anxiety of misunderstandings, economic participation barriers and varied employment systems, are taken into consideration. The long list of future operations and actions are specified to reach the aim of being a proud, multicultural city. The initial actions are set for the period of next two years.

3.4. SPECIFIC CONDITIONS OF PLANNING IN GDANSK AND IN GDYNIA

3.4.1. PARTICIPATION IN URBAN PLANNING

Participation analysis criteria, fulfilling good governance idea indicators and the used tools were described in previous part. Analyzing strategic documents, local resolutions, information put on the office's internet site and analyzing reports of the consultations we can make initial assessment of both cities in the range of openness – participation.

A. THE LEVEL OF INFORMING:
The authorities of, both cities inform the citizens on undertaken decisions (concerning city budget, changes in fees, traffic changes, investment planning – rarely subjected to consultation); the citizens are also informed of the decisions which should be subjected to consultation (Local Development Plan, cooperation with NGO's program among others). The main mean of informing the citizens of the decision made is the internet site of the office and Civic Information Bulletin. Less often the information is conveyed through local media or other methods, unless they concern controversial matters (media inform as first).

B. LEVEL OF CONSULTATION:
Both cities have legal basis to conduct consultation accepted by the resolution of the city council. Unfortunately, the internet sites of the cities lack distinguished bookmarks. The information on consultations are inaccessible. The consultation last during 14 to 21 days' time period on average. The cities do not formulate or share annual schedules, consultation plans and annual reports. Most often already prepared projects undergo consultation (in years 2010 to 2014 rarely variant solutions occurred, no evident consultation for assumptions); the exceptions are bigger projects, for example concerning development, evolving strategic documents where different forms of participation and possibilities of voicing one's opinion occur, for example through attending

workshops were consultations of assumptions appear. The cities do not formulate or share annual schedules, consultation plans and annual reports. The cities take into consideration principles of equal chances during consultation (internet sites are adjusted for visually disabled, the meeting spots are adjusted for the disabled most of the time, hours in most cases are adjusted to the needs of working people). The main source of information on planned consultation is the internet site of the office mostly Public Information Bulletin), less often they appear in local media. Rarely as posters, flyers or meetings etc. The data given during the consultation do not contain the areas not subjected to consultation, not always are given in open formats (searchable) or are understandable for everybody (lack of accessible language, clear structure of the document, graphics, short presentation of main points etc.); There are appointed persons in the offices responsible for conducting consultations. The offices publish reports of the consultations (unfortunately, not all are accessible) which contain all essential elements as: presentations of declared positions, answers and justifications of accepting or rejecting the remarks. The main source of information of the results of consultation is the internet site, rarely the information appears in local media, unless the they concern major investments or controversial solutions. In consultation regulations of both cities are entries concerning the evaluation processes of the participation, unfortunately, there are no reports of evaluation accessible.

C. LEVEL OF CO-DECIDING:
In both Gdynia and Gdansk tools as participatory budget, local initiative or civil legislative initiative are accessible, although all of those tools need perfection in distinguished levels. District councils are in function in both cities, expedient councils are created (like Councils for Public Benefit Work, Councils for Persons with Disabilities, Senior Councils). Strategic documents are, in most cases, worked out by working parties. There are also tasks commissioned to NGO's.

3.4.2. SUMMARY: CITIES ON THE LADDER OF PARTICIPATION

Despite differences in the structures of the offices, introduced programs and financial resources on participatory administration, the state of social consultations in Gdansk and Gdynia are not significantly different (including good practises which are rare). All of the elements of the ladder,

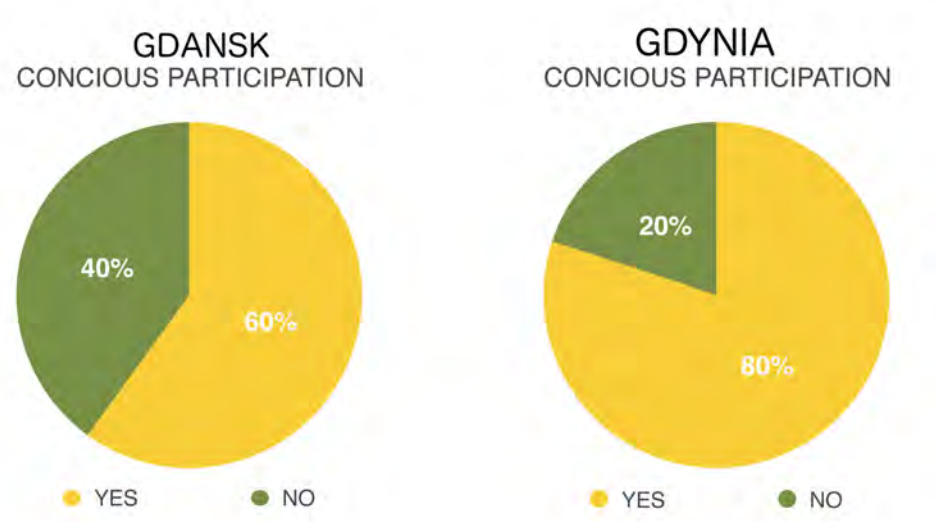


Fig. 28. Concius participation in questionnaire in Gdansk and Gdynia
Source: by A. Bielecka

Fig. 29-34. by A. Bielecka

whether it is the level of informing, consultation or co-deciding, need improvement of already existing mechanisms or introducing new practices. It is not possible to unambiguously define the level of participatory democracy in both cities for the first, basic level does not apply to all areas. The basic decisions concerning the people of Gdynia and Gdansk are forgotten. Mechanisms of co-deciding are not applied to the point where they become natural, obvious in the process of administering the cities. The social consultation and participatory budget are only substitute of co-deciding and shared responsibility that will be carried out by the authorities. While we know which areas need renewed analysis and improvement.

Despite declared in the media openness of the authorities of one or other city the area of transparency needs improvement (for instance in the range of publishing the documentation, contract registry and others) and education which should be directed towards the citizens so that participation in the processes would be conscious.

3.4.3. SPECIFIC CONDITIONS OF PLANNING IN GDANSK AND GDYNIA

Gdansk and Gdynia are two harbor cities that borders are neighbors. Being located by the Gdansk Bay, they have rich history and unique way of planning because of their seashore nature. The question arises: are the plans of developing of these two cities alike or do they differ? The Analysis of Conditions and Directions of the City Management is a basic tool describing the direction and rules of space policy in each of the cities (Sejm, 2003: 3). The document describes local rules of management and coordinates the space management decision making process, which needs to follow it. Both cities have also developmental unities which look at both current state improvement as well as future strategies. Gdansk uses a few documents regarding space planning. Gdansk 2030 Plus Development Strategy is a superior element in terms of managing the development of Gdansk. It refers to previous experiences in terms of key processes within the city. From what one can find in

the document, "The Strategy is aimed at determining the development priorities for the next several years and identifying the challenges that we will have to meet within this period of time. In order to meet the needs of the current and future inhabitants, the Strategy outlines the directions that will strengthen the social, economic and cultural potential of Gdansk. It also forms the grounds for conscious shaping of processes taking place in the city and it strengthens the development stimuli of the Gdansk metropolis and the whole of Pomerania" (Czepczynski, Bierut, 2014: 7).
Gdansk Development Strategy is based on 5 main goals:

- Education and social investment:
  - easier access to educational and protective services;
  - improvement of teaching quality in schools;
  - increase of social cohesion and support for the socially excluded as well as those being in danger of exclusion;
  - increased interest of inhabitants in the city's issues;
- Economy and transport:
  - increase in the number of workplaces;
  - increased role of public transport, pedestrian tracks, bicycle lanes in inhabitants' commuting;
- Public space:
  - increased number of inhabitants satisfied with the public space;
  - higher quality and accessibility of recreational areas;
- Culture:
  - increased contribution of inhabitants and tourists to culture;
  - increased sense of unity between the inhabitants and Gdansk;
- Health:
  - improvement of the inhabitants' health condition;
  - increased rate of physical activity fans among the inhabitants.

Gdansk has always had a relation with its waters - the rivers and the sea. As an attempt at bringing back the potential role of water, The Urban Strategy for Gdansk was created. In the document of Urban Water Strategy for Gdansk, there are proposed some interventions. The aim of them is to use water to increase the social, economic, environmental and cultural strengths of the city (KuiperCompagnons, 2015: 56). At the same time interventions are proposed to increase water safety and to prevent future flooding.

Just as it is in Gdansk, Gdynia's main document in case of spatial planning is the City Development Strategy. Gdynia's Development Strategy 2030 is being worked on currently (Rada Miasta Gdyni, 2013). The document is supposed to indicate the direction and aim which is to be achieved. It is going to be designed as to allow using human, financial, infrastructural and natural resources more efficiently as well as the city's strengths. It will indicate Gdynia's weak points and identify potential future obstacles for its development. It will be a source of knowledge about the city's social and economic situation as well as about its future development direction for both inhabitants and entrepreneurs. The process of constructing the strategy is divided into a few stages. The most important ones are Gdynia's social and economic determination presented within five areas: demography, economy and labor market, living conditions, spatial structures as well as transport and infrastructure. The vision diagnosis was designed in cooperation with the inhabitants and it contains the development plan - the city's expected condition in 2030, detailed and strategic aims as well as the realization process, which means how the strategy is going to be incorporated, monitored and evaluated.

Currently it is the City Development Strategy (Rada Miasta Gdyni: 1998) which is valid and it covers action within the following directions:

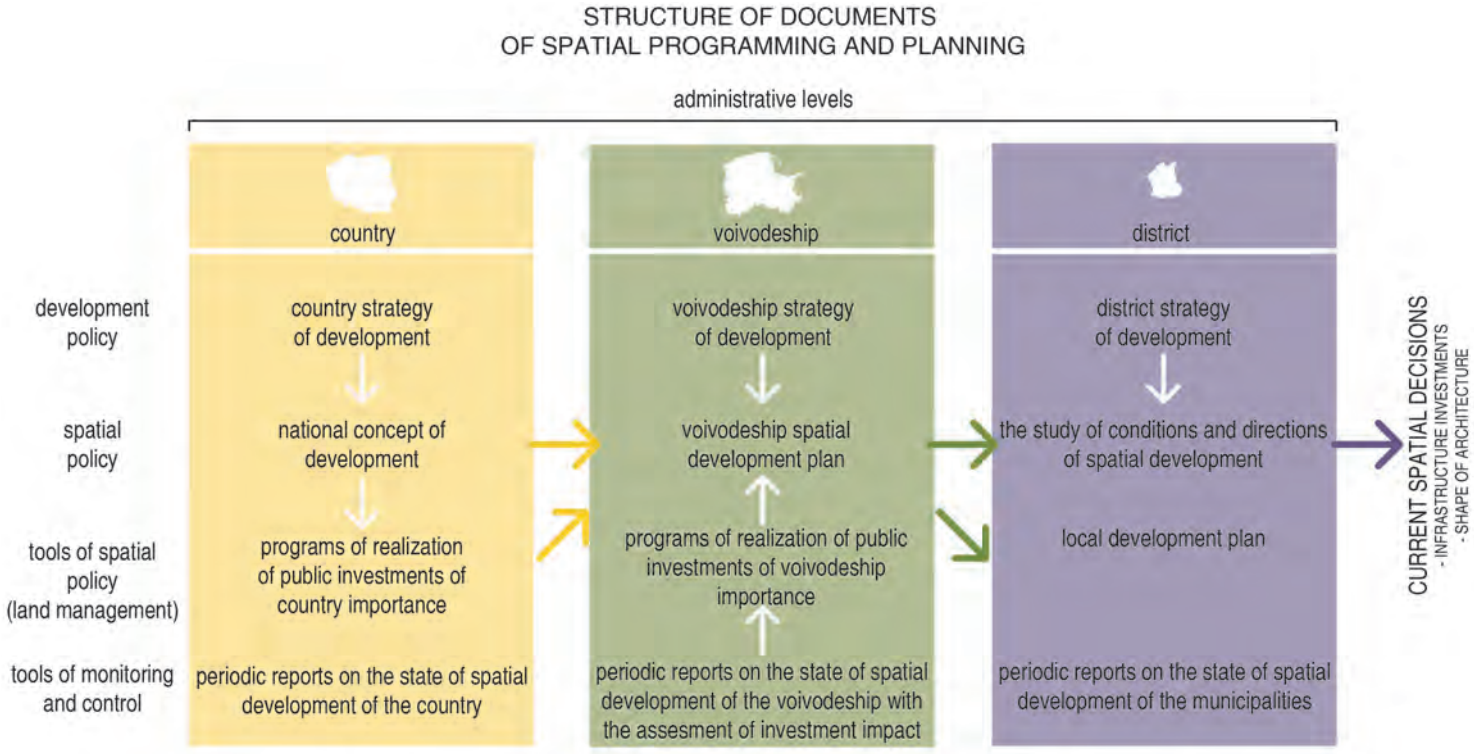


Fig. 35. Structure of documents of spatial programming and planning in Poland
Source: Karolina Krosnicka, presentation "Basics of local governance in Poland", slide 8

- Space management - planned and inhabitants-friendly city space management and also managing the common goods according to the rules of the balanced development.
- Education and upbringing - improving the level of formation and preparing Gdynia's inhabitants to use their abilities in their private and professional life thanks to upbringing techniques.
- Citizen society - supporting individuals, families and local societies in order to fulfill their basic social need - maintenance, living place, healthcare.
- Higher quality of life - fulfilling higher needs in terms of the access to cultural goods, sport facilities, wide range of possibilities to spend spare time for the inhabitants and tourists.
- Transport and communication - creating an effective and eco-friendly system of public transport as well as road constructions compatible with the needs of a well-functioning and developing city.
- Entrepreneurship and innovation - support for the economical city growth both within the traditional Gdynia marine economy and new branches of modern technologies economy.

The new Strategy covers the permanent, socially accepted and ecologically safe European standards thanks to optimal use of natural, human, economic resources and also the advantages of the city location. To achieve the goal it is necessary to use the resources mentioned above.

Gdynia as a city has been involved in creating the "Logistics Valley" within its area and also within Reda, Rumia, Wejherowo and Kosakowo and Wejherowo boroughs. The Balanced Development Strategy of the functional area called the "Logistics Valley 2020" with the prospect of 2050 is supposed to support the idea. The aim is to create comprehensive and integrated infrastructure development, which adds to the attractiveness and innovation of the economy and settlement of boroughs creating the project as well as the high quality of life within the area. The key development

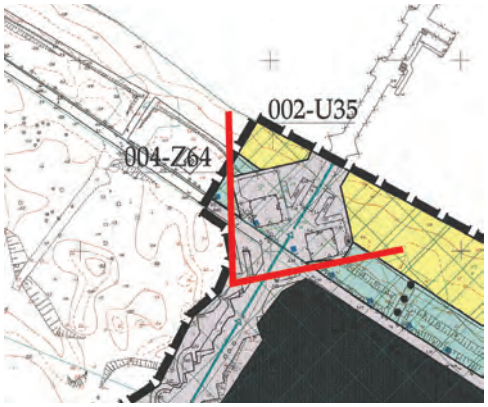


Fig. 36. Part of the Local development plan for Gdansk (no. 0118) with marked area of behavioural mapping research.
Source: http://www.gdynia.pl/bip/zagospodarowanie/info/439_50756.html

factor of the "Logistics Valley" is the economy including the Transport-Forwarding-Logistics sector, mainly within the area of the harbor in Gdynia (Port Gdynia: 2015).

Moreover, Gdynia functions according to the Balanced Development Strategy of the functional area - Seaside Service Area NORDA 2020 with the prospect of 2050 containing 11 boroughs. It has been designed to complete broad, common development projects beyond one borough's borders. It is supposed to help local governments in preparation and realization of common goals and support the problem-solving process beyond administrative borders of boroughs.

Regardless all the projects, Gdynia and Gdansk are coauthors of the draft of document: Metropolitan Area of Gdansk-Gdynia-Sopot Strategy up to 2030 (Czepczynski, Drozd-Wisniewska, 2015). It's a document being a conclusion of a long-lasting discussion over the functioning model of the Metropolitan Area. Facing the challenges and opportunities the metropolisation brings, the subjects responsible for creating the Metropolitan Area of Gdansk-Gdynia-Sopot have started actions aimed at constructing a common strategic document, which is supposed to be a tool allowing coordination of the work within the most essential areas. The main aim of the Strategy of 2030 is to add to local and sector development strategies' goals, actions and projects which should and can be performed more efficiently and in the process of cooperation. Development activities in Gdansk and Gdynia come from current conditions and developmental trends but also from the inhabitants' ambitions and expectations. The future means attracting new inhabitants and providing a high quality of life, maintaining traditional values and unique cities' features.

3.5. URBAN PLANNERS APPROACH- ANALYSIS OF EMAIL QUESTIONNAIRE

Fig. 37. Part of the Local development plan for Gdynia (no. 1302) with marked are of behavioral mapping research
Source: http://www.gdynia.pl/bip/zagospodarowanie/info/439_50756.html

Based on historical analysis we can formulate a hypothesis that cities as Gdansk and Gdynia have a completely different spatial politics.

In order to compare a way of thinking of urban planners, the questionnaire has been constructed. Questions concerned the way of the town-and-country planning, quality of environment and the relation with the sea. 5 persons from Gdansk and Gdynia were interviewed.

3.5.1. GDYNIA

1.Which are the main features that make a city distinguishable among others?
Respondents from Gdynia answered similarly to the respondents from Gdansk. They noticed that seaside location, boulevards and modernism architecture are the main advantages. Also a lot of trees along the streets outweighed for them.

2. Do you have a general vision how Gdynia/Gdansk should look like in 20 years time?
In general, people mentioned Gdynia and Gdansk as collaborators. But Gdynia is supposed to be a modern, innovative city and to move it oneself in the direction of the sea.

3. What are the strategies orientated on protection of the environment?
In their answers people are including guidelines in records, so as guidelines concerning building materials and the biologically active areas. Urban planners are concerned about inserting fountains, brooklets and lanes of trees into the space of the dense city centre.

4. Relation between the Baltic Sea and the city.
The strongest report is occurring in the economic and recreational context. In these aspects the Baltic Sea is regarded as the main factor determining development.

5. Is the public opinion being taken into consideration in urban planning?
Yes. Majority of planners are trying to cooperate with inhabitants as well as the districts councils. One person answered that he wasn't cooperating.

3.5.2. GDANSK

1. Which are the main features that make a city distinguishable among others?
For urban planners from Gdansk the historical context as well as the abundance of cultural events are most important. As similarly as in Gdynia, a seaside location is performing the substantial role.

2. Do you have a general vision how Gdynia/Gdansk should look like in 20 years time?
Gdansk in the future will revive all neglected places and in the future will be growing to the South. Unlike Gdynia, the city will be well up to the development of events and cultural facilities retaining the strong historical identity in addition.

3. What are the strategies orientated on protection of environment?
Mainly, preserving biologically active areas, "eco-friendly corridors" and energy-efficient infrastructure. As similarly as in Gdynia, high green is performing the substantial role in the city centres.

4. Relation between the Baltic Sea and the city.
For urban planners from Gdansk a recreational and social context is the most material report. They think, that for inhabitants, Gdansk doesn't have a so strong economic dependence of the Baltic Sea.

5. Is the public opinion being taken into consideration at urban planning?
Yes, but unfortunately the public opinion often confines itself to complain and it is not helpful. Still there are very few people which are becoming involved.

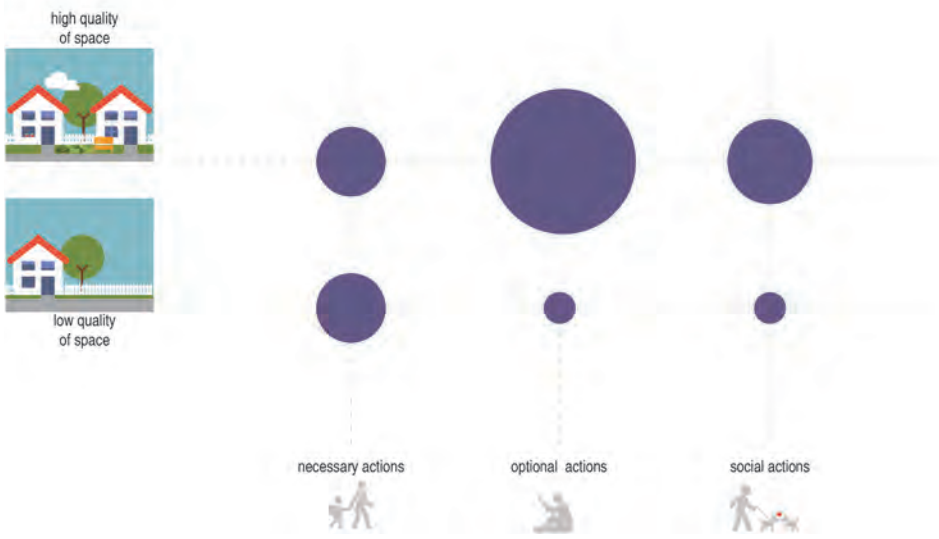


Fig. 38. Graph prepared by Jan Gehl presenting the connection between occurrences of kinds of action in relation to the spatial background
Source: (Gehl, 2011: 11)

	001-U35	002-U35	003-Z64	004-Z64	005-KX
use	beach	beach	dunes	dunes	promenade
existing land usage	not stated	not stated	promenades and bike paths	not stated	service pavilions for the Brzeźno pier
Rules for spatial order	• area included into OSTAB* plan	• area included into OSTAB* plan	• area included into OSTAB* plan • any kind of buildings is prohibited • car parks are prohibited	• area included into OSTAB* plan • any kind of buildings is prohibited	• area included into OSTAB* plan • trees should be preserved, if some of them are planned to be cut, for each 1 cuted tree 5 new ones should be planted
Rules for buildings design	not stated	not stated	not stated	not stated	• non exceeding line of development was marked • maximum development intensity - 0,1 • maximum height of buildings - 10,0m • minimal greenery coverage - 5% • forms of buildings and development - any • roof shape - any
Rules for designing public spaces	• small architecture is allowed • stand-alone advertisements are prohibited • greenery is allowed	• stand-alone advertisements are prohibited • small, temporary service buildings are allowed • greenery is allowed			• small architecture is allowed • stand-alone advertisements are prohibited • temporary service points are prohibited • technical infrastructure is allowed • greenery is allowed
Rules for temporary spatial development	temporary development is prohibited, except for the tourist services during season	temporary development is prohibited, except for the tourist services during season			
special conditions for spatial development					• car parks and bike rent points are allowed • tourist service point location is marked on the plan

*OSTAB programme (City-wide Systems of Biologically Active Areas) is a continuous structure penetrating urban fabric connecting with each other the most valuable green spaces for Gdansk, Gdynia and Sopot. The OSTAB structure was defined in The City of Gdansk Study of the conditions and directions of spatial development in 2001. [8]

On the areas included to the programme the rules for spatial development were settled (between others):
- prohibition of localization in the area or in the closest proximity functions with strong impact on the environment,
- preserving – if it is possible – current state of usage according to the functions of OSATB programme,
- striving to enlarge the amount of areas included into programme,
- devoting non developed areas for public and recreational functions,
- restoring natural conditions in the areas – elimination of anthropological impact,
- striving to eliminate gaps in the system caused by technical infrastructure and minimalizing clashes.

	general rules that must be respected in all functional zones of MPZP		36 ZP,KD-X,UT
public space design	• promenades and bike paths system must be preserved and developed as drawn on the plan (bike path along sea boulevard) • public greenery zones • all public spaces must be accessible for handicapped	use	arranged greenery, public squares, promenades (for pedestrians and cars), tourists services
advertisements	• shape and size of advertisments signs must be adapted to the architecture of building • if there is a group of signs they must be the same size and must be placed in the same area • there are stric regulations for size of signs • neon signs are prohibited • there are stric regulations for signs placemen for all functional zones for ex. on servicie buildings signs are allowed ony on the floor with servicies, stand alone advertisments are prohibited; in the zone of public greneery any kind of advertisment signs are not allowed	heritage and culture protection	„E" zone of Kamienna Mountain urban structure exposition: • prohibition of creating buildings or any other elements, that could depreciate exposition curator protection - zone II: • prohibition of creating buildings or any other elements, that could depreciate exposition • protection of historical urban and architectural structure of „garden city" complex: • new buildings must refer to the historical structure (with their scale and detail) • plot percolation is under protection
		rules for buildings design	intensity of development - not stated height of buildings - 1 floor - 5,0 m flat roofs non exceeding development lines - as marked on the plan bike path - as marked on the plan

3.5.3. SUMMARY

To sum up the results, unfortunately only a few planners were co-operative. But, the ones which took part in the survey, demonstrated the highest level of the awareness in the pro-ecological design. It turned out that general rules of the town-and-country planning in both cities were quite similar, but the future of both cities is being described totally different. The most surprising might be the the assumption made by Gdansk city planners, that Baltic Sea does not have a strong economic influence on the citizens.

3.6. GDANSK AND GDYNIA CITIZENS USE OF SPACE UNDER PLANNERS MANAGEMENT

Being provided by achievement of urbanism, local tradition, economy, environment conditions, social structures, natural conditions, politics and more, (Chmielewski, 2010:9) planners make conscious decisions about particular area of spatial management, thus they have big influence on the functional and social aspects of the space. In the planning process different kinds of land use are being specified and marked on plans: housing estates, services, recreation areas, agricultural areas, industrial areas, green spaces and roads (Sejm, 2003). Decisions of planners have influence on the future area development by the documents they are creating.

The main basis of urban management in Poland is act from 27th of March 2003 on planning and urban development (Sejm, 2003). The main purpose of this regulation is to define administrative frames based on spatial order and the rules of sustainable development.
Based on documents used during spatial management in Poland few main elements of the system could be defined: development policy, spatial policy, tools of spatial policy and tools of spatial monitoring and control; all of them - based on particular documents - are being used on country, voivodeship and commune level (Krosnicka, 2016).
Papers are prepared by multidisciplinary teams because they touch many aspects of spatial management like infrastructure system, land use, cultural and natural environment, protected area, economical aspects and much more. They described actual spatial situation, present directions of the development of particular issues, show programs and tools to achieve goals and suggest way of monitoring and evaluating of particular issues. Most of them are just non obligatory in decision making by authorities and designers. Despite this they are very useful in practical for country, voivodeship and commune management and development.

In case study in this article - analysis of public space under the city planners management - we would focus our attention on one planning document - local development plan. It is not only tool of spatial policy, but also act of local law which obligate designers to follow rules described in it. Local development plans are prepared by city planners or private companies in accordance to commune study of conditions and directions of spatial development (Ministry of Infrastructure, 2015). The study is superior document it is prepared by commune mayor, borough leader or president in cooperation with urbanists, spatial planners and specialist from other fields and agreed by many city institutions. The document consist of graphical and verbal part presenting localization of particular functions, regulatory lines, plot divisions, maximum building height, roof slope angle, preserved objects and areas could be defined.

In the diagnostic part of the report "Poles space of living" the dissonance between law tools for spatial development and the quality of spaces created on the basis of it, is clearly marked (Czyzewski, Czyzewska, 2014). One of the main reasons for this situation, mentioned by the authors, is rigidity of Polish spatial development policy – it is not adequate to the incessantly changing needs and

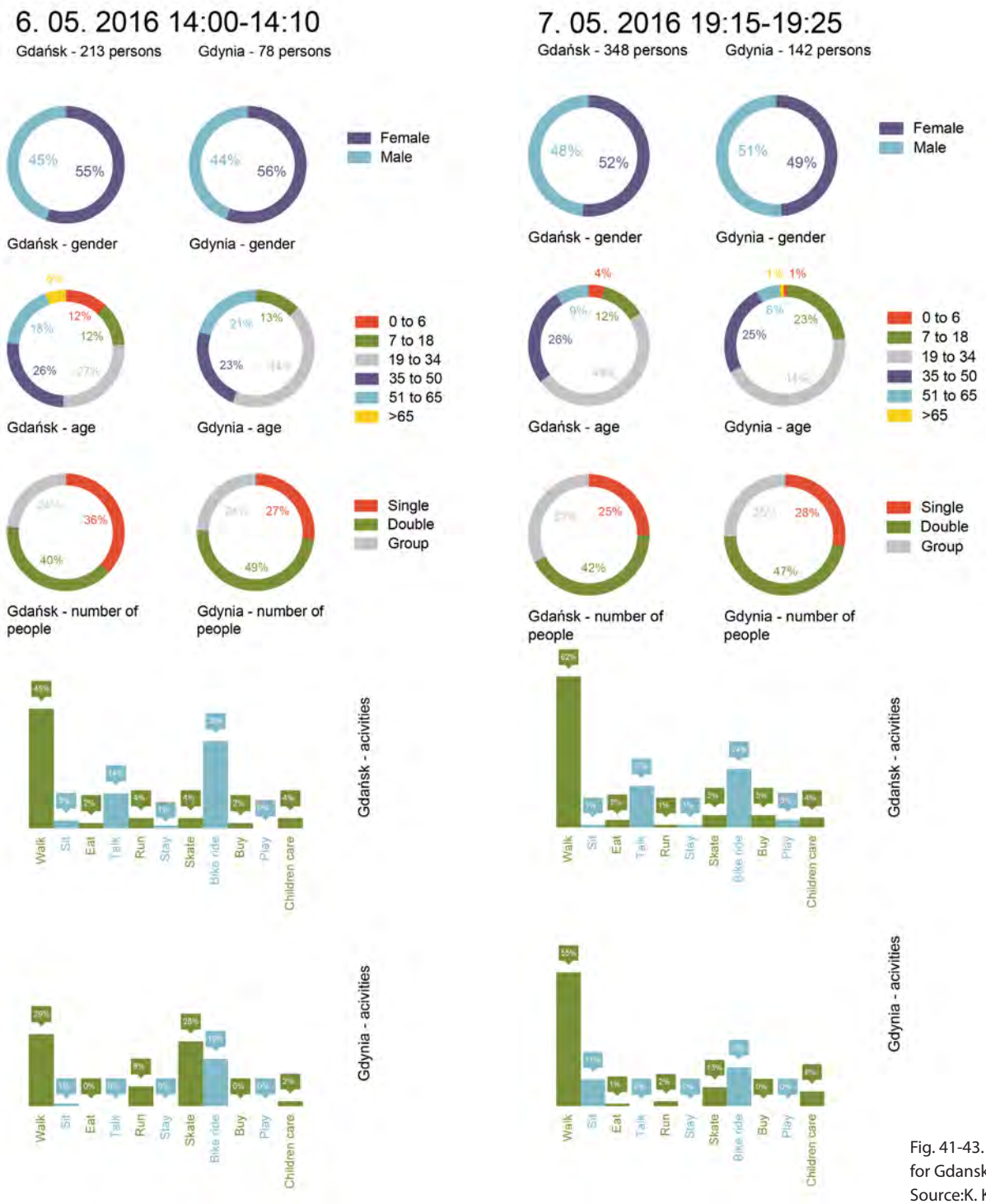
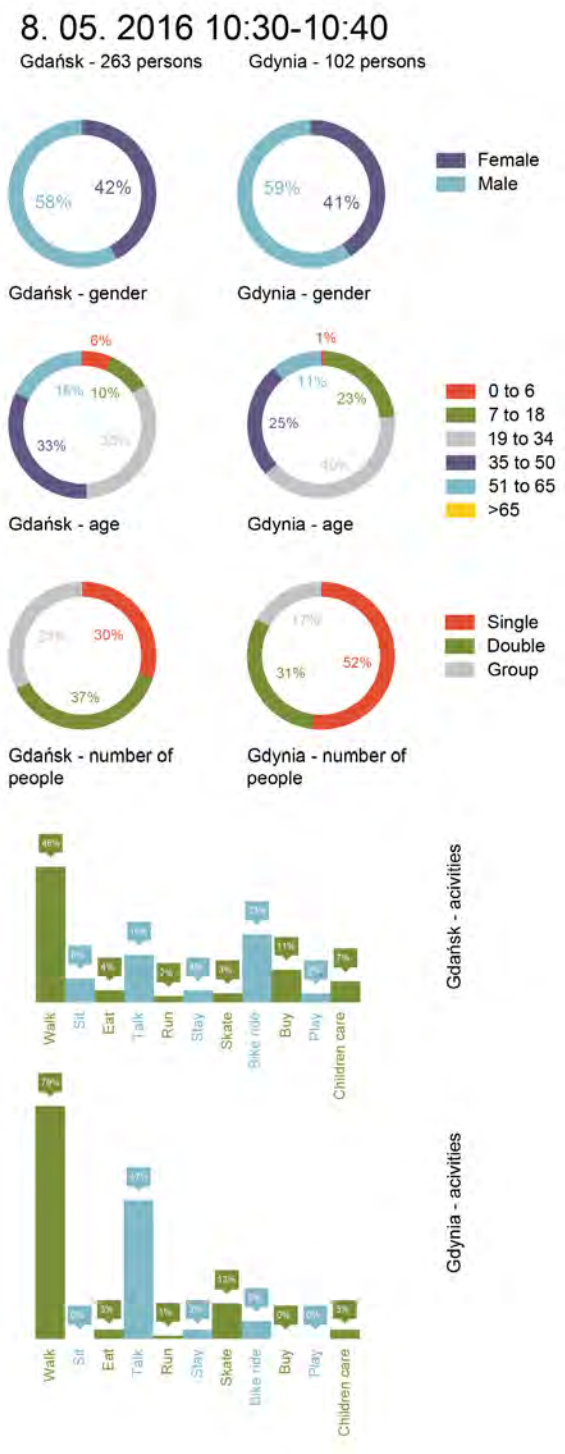


Fig. 41-43. Behavioural mapping results for Gdansk and Gdynia,
Source:K. Kupczyk, I.Haxhiaj, P. Wróbel



investment possibilities. Moreover the current law is not adapted to the modern urban reality. In many regions of Poland it is nowadays more crucial to support the ideas of sustainable development and to create the chances for cooperation of different groups of investors. It seems that the tool that is available is created rather to support suburbanization process than to organize and plan in the already built environment.

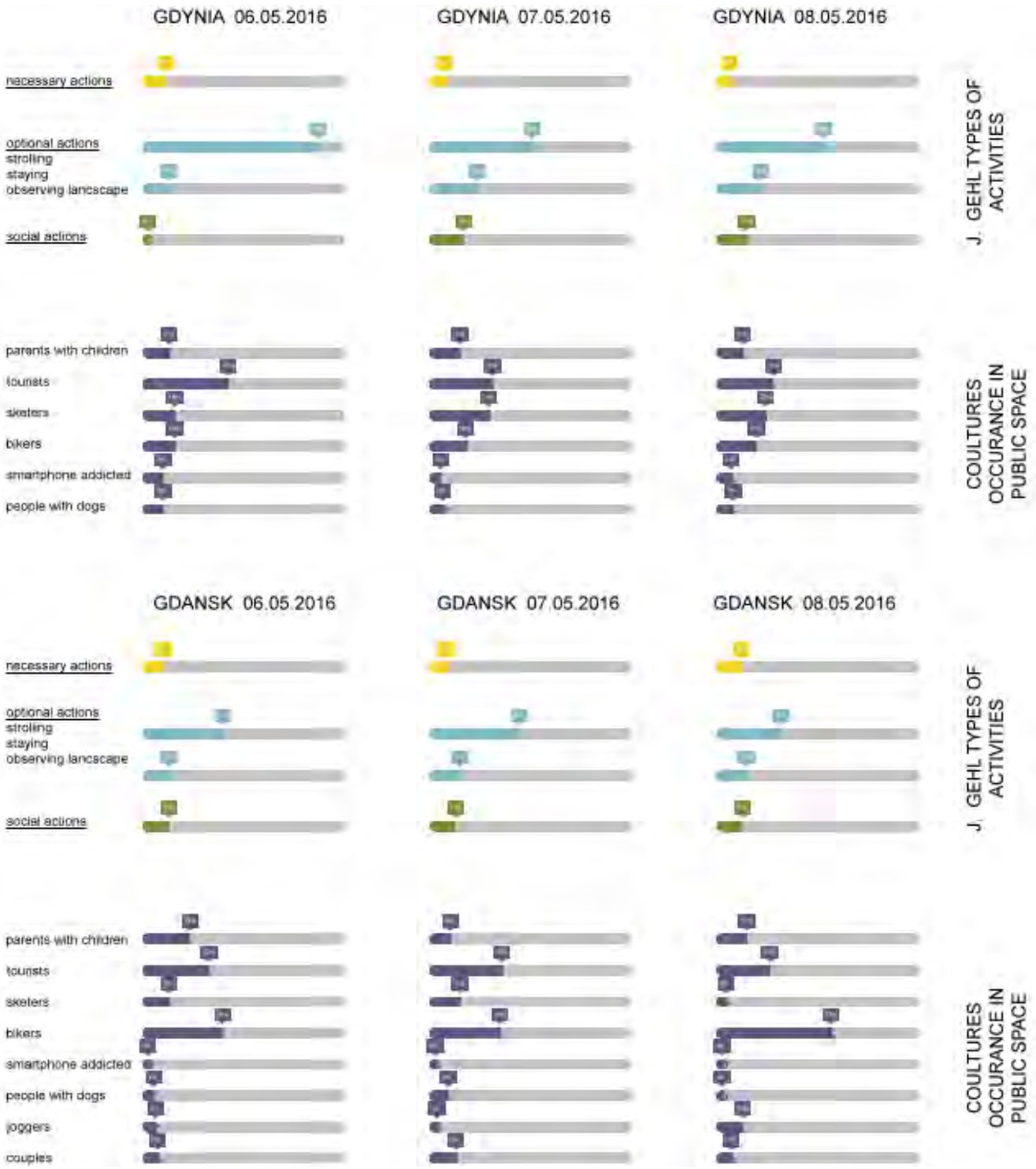
The biggest problem is equalization by the spatial development act the private and public business. There are no clearly defined duties resulting from the law of ownership and regulation of its execution. In spite of encouragement in the act for using public consultations while establishing local development plans, it does not provide legislative methods to support citizens involvement into the process. If we focus just on local development plans, the most important issue is lack of ways to assess the quality of architecture and public spaces created with its regulations. Usually designs are accepted by the council if only they are in accordance with the regulations of the plan. Local development plans are seldom design by taking into considering and public consulting different spatial variants. Although that would allow to involve all actors interested in particular area development. Furthermore the process of creation of local development plan in mostly considered as technical-administrative activity where the involvement of local community is treated as one of many formalities to fulfill (Czyzewski, Czyzewska, 2014: 33).

In our research we decided to compare the local development plans principles and the needs of public space users and theirs ways of using it. By this we wanted to find out if the dissonance mentioned above is existing and visible in the urban structure of Gdansk and Gdynia.

Non participatory research method was used to compare usage of public space of Gdansk and Gdynia with planners decisions established in existing local development plan principles (resolution no. XLVII/1624-1606 of Council of the city of Gdansk, 26 January 2006 and resolution no. XXI/507/08 of Council of the city of Gdynia 26 January 2008).

While talking about public spaces, their management, functioning and research methods is hard not to mentioned about J. Gehl. Danish professor, researcher and urbanist. With his wife - psychologist, they were analyzing well-functioning public spaces -mainly Italian cities from mediaeval times. This gave them materials to prepare guidelines for redesigning public spaces and streets in other countries all over the world. Finally their ideas entered into practice have great influence not only on public spaces but on all cities that started and producing functioning and higher quality of life for citizens. In one of his book J. Gehl is describing common types of activity types in public spaces. Three main outside the house activities can be established: necessary actions, optional actions and social actions (Gehl, 2011: 11).

To the first ones we can rate more or less obligatory and everyday activities (going to school, work, shopping, waiting on a bus stop). According to Jan Gehl theory, because of the necessity inscribed into theirs characteristic, the spatial background have almost no impact of their occurrence. To the second category we can rate activities which occur when the human feels need and have time to do them (strolling, admiring the landscape, sunbathing). Occurrence of these activities have a strong connection with the spatial background and its attractiveness. Into the last category we can rate those activities that occur in the public space and involve presence of other humans (talking,


GDYNIA 06.05.2016
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necessary actions
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strolling
staying
observing lancscape
social actions
J. GEHL TYPES OF ACTIVITIES
parents with children
tourists
sketers
bikers
smartphone addicted
people with dogs
COULTURES OCCURANCE IN PUBLIC SPACE
GDANSK 06.05.2016
GDANSK 07.05.2016
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necessary actions
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J. GEHL TYPES OF ACTIVITIES
parents with children
tourists
sketers
bikers
smartphone addicted
people with dogs
joggers
couples
COULTURES OCCURANCE IN PUBLIC SPACE

Fig. 44. Behavioural mapping results for Gdansk and Gdynia, considering Gehl activities and cultural groups
Source: by E. Skiba

observing others, listening to the others, children playing). Social actions are mainly resulting from the presence of necessary and optional actions, they are spontaneous and they are the direct result of being surrounded by the other people. Proportions between these three types of activity could define quality of physical surrounding in particular public space.

City planning process should be a balance between knowing the image of the city spaces inscribed in citizens habits and the vision of the city for the future. To know the space in this case does not mean to be familiar only with technical data about exact place but to understand the way the spaces are used, to know its strengths and weaknesses. Spatial management should pay special attention to public spaces, since they are places - as social anthropology claims - of celebrating of commonwealth sensing and places in which interaction between cultures can occur.

Local development plan is marking the localizations of public spaces but there is no tool to specify precisely how the public space should be designed to fulfill the needs of its users; it is only up to a good will of commune. Thus it is possible that spaces envisaged by city planners as vibrant public spaces would be empty not only because of poor architecture but also because of lack of adjustment to local culture and character of society.

Research of Jan Gehl enabled pointing out basic principles helping to design public spaces to encourage humans behaviours such as walking, sittings, stopping, standing, observing, listening and talking; three types of activities mentioned before consist of these behaviours. All of mentioned in his books rules allow to introduce changes, which could strengthen or introduce optional actions and social actions into urban public spaces.
In this part of the research influence of planners management on the real view, quality and functionality of particular public spaces in Gdansk and Gdynia will be checked. Based on local plan development analyzing and non-participatory method of behavioural mapping, relation between planning theory and real use of the space will be described.

3.6.1. DESCRIPTION OF THE CHOSEN PLACE: LAW ASPECTS

To sum up, according to Gdansk local development plan there are clearly marked spaces in which development of new buildings is allowed. Height of new investment could not exceed 10m. The form or architecture is not limited by almost no regulations. There is possibility to build objects of "small architecture" (like benches, flowerpots or bike racks) as well as service points for tourists. Planners obligate to save and protect existing trees, what more allow to plant new greenery. Temporary buildings are prohibited. The place is located just next to area of green landscape and ecological - dunes which are protected by law and with beach sea. All the area are threatened by flooding as a result of accumulation of storm water sea.

In Gdynia local development plan area dedicated for greenery, public places, pedestrian paths, pedestrian-bike paths, tourism services is in the range of exposure of historic urban area, thus it is placed in the conservator's protection zone.
It is allowed to build new buildings however theirs build-up area should not exceed the lines of development. The place is threatened by flooding by the sea waters. There is no restriction about putting new "small architecture objects" and greenery.

3.6.2 VERIFICATION: INFORMATION FROM NON-PARTICIPANT OBSERVATIONS

By behavioural place-cantered mapping research method following conclusions were stated. In Gdansk during every research time and day much more people were observed (more about two

times). Probably it doesn't mean that people in Gdynia visit coast rare, but because of the location the observation area in relation to the boulevard as a whole. In Gdynia the end of boulevard was observed, so flow of the people coming mostly from one direction. While in Gdansk research was in intersection of paths and people could come from different directions. What is also interesting both places could be considered as a not destination point, but a transit path of free time activities. The result was also influenced by duration of the observation (10min) and a character of place with relative low number of seating places. In Gdynia more younger persons (mostly 19-34) are using the space, when in Gdansk we have balance between younger and older (dominated groups 19-34 and 35-50).It could be caused by demographic structure of the particular city what also could determine the fact that in both cities the biggest number of people are observed in the evening – time after work. As "country capital of bikers" in Gdansk during every research time more persons than in Gdynia were cycling.

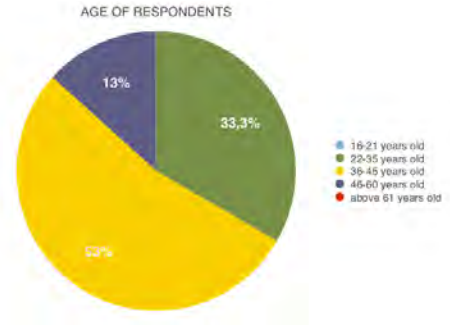

Fig. 45. Age of Respondents
Source: by E. Skiba

3.6.3 CITIZENS USE OF SPACE UNDER PLANNERS MANAGEMENT - CONCLUSIONS

To sum up, local development plan in Gdansk clearly marked spaces in which development of new buildings is allowed and theirs size. However the non-exceeding lines means that the building might stand in that line, it is not obligatory to do that. The only obligation is not to build over that particular line. That means, that urban planner do not have a clear vision about the desired shape of public space. What is more, there is left a free choice for private investors to decide about the shape of architecture. Regulations for public spaces are rather tritely. There is no statement claiming accessibility for disabled people. It does not states or even mark location of paths for pedestrians or bikers. Moreover it do not mark the coastal line as a landscape line worth protection, not mentioning that the view axis of pier and opening to it is also omitted in the plan, and part concerning advertisements placement is rather brief.

The local development plan prepared for Gdynia is more detailed, when compared to Gdansk's. The paths for pedestrians and bikers are clearly marked. Coastal line is presented as a landscape line that should be preserved. Regulations for new buildings are more detailed and even if the same line is used for defining location of them, it seems, that investor cannot do whatever he wants to. Furthermore, observation point used in our research is located in two different zones of conservator's protection, what gives a chance that the architecture created for this area will be reviewed. In the descriptive part of the plan there are detailed statements about the location and size of advertisements as well as accessibility of public spaces for disabled people.

Fig. 46. Associations with word "CITY"
Source: E. Skiba

When we compare just layouts of both plans, it seems that Gdynia's has more clear graphical structure, although it has a lot of information on it. While Gdansk's seems to have a lot of data, but when we look up the legend it shows, that there are just the basic information marked. Gdansk's local development plan seems to confirm the present status of the space, while Gdynia's introduces some changes.
Descriptive part of both plans are completely different. Gdansk give almost no general regulations obligatory for all functional parts, while Gdynia does. It also Gdynia, that gives impression of city more open for the citizens, since its plans are easier to read and understand. However that might be just personal impression of researcher.

For our research topic, the most important difference is the face that Gdansk omits the problem of disabled people, as well as culture of bikers and pedestrians. It is even more surprising when compared with the results of behavioural mapping. That gives a general impression that Gdynia is more open for multicultural ideas, even if it has less visitors.
When focusing only on types of activities according to J. Gehl definitions, difference between

Fig. 47. Associations with word "SEA"
Source: E. Skiba

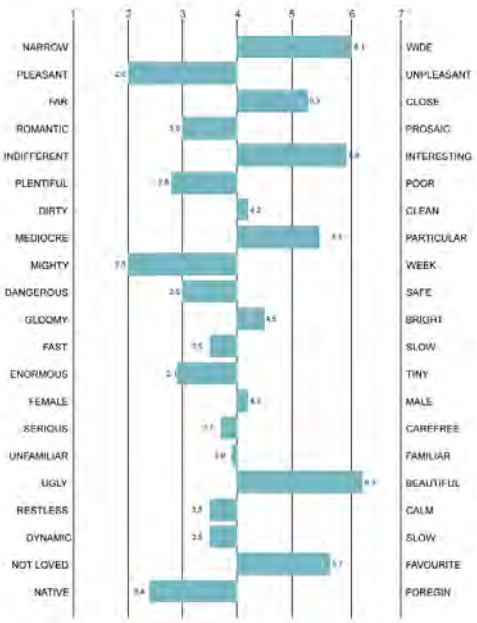

Fig. 48. Results
Source: E. Skiba

Gdansk and Gdynia is visible mostly in occurrence of necessary activities and social actions. Theirs number is higher in Gdansk for all moments of the day as well as dates of observations. Occurrence of optional actions are similar for Gdansk and Gdynia when it comes to strolling. Although the number of people sitting or staying in public spaces, is higher in Gdansk than in Gdynia. Thus, in Gdansk social activities occur more often. The difference between these two cities might be caused by the character of the spaces. Gdynias promenade do not have attractive location or design of benches. Sea is barely visible while sitting on them. The only thing to admire are groups of people strolling on the background of concrete wall. One of the reasons why people stay longer around entrance to Brzezno pier in Gdansk are the local service points serving different snacks, attracting tourists and children. Another reason might be the fact, that pier is an orientation point, which serves as a meeting point.

While considering multicultural aspects of public spaces in Gdansk and Gdynia, the same cultural groups of users can be distinguished. These are: tourists, parents with small children, in-line skaters, bikers, joggers, people with dogs, dating couples. In both places, the probability of meeting tourists is comparable. Number of parents with toddlers is greater in Gdansk than in Gdynia, however their number is changing depending on the moment of the day. Relation between number of parents and the moment of the day is the same for both Gdansk and Gdynia. What is interesting, in Gdynia we can meet more people walking with their dogs than in Gdansk. In Tricity, Gdynia one of the firstones to establish dog friendly beaches. Later, Gdansk set up the similar place in Brzezno district, but dog keepers are not satisfied with it because of the rocks and stones threatening them or theirs favourites.

When comparing the number of bikers and skaters, the results are quite the same. Spatial solutions for those groups are also similar in both cities. Bikers as well as in-line skaters are using the same, narrow bike path. That often leads to bumping into each other. Additionally the path in Gdansk is interfering with the main direction of the flow of pedestrians, what also might cause some friction between these three groups.

The culture of fit joggers might be visible in the early hours of weekend, especially in Gdansk. Brzezno pier seems to be a starting point of running paths either it is point worth passing by while jogging. On the afternoon both Gdansk and Gdynia are places to be chosen for romantic walks especially among couples on theirs firsts dates.

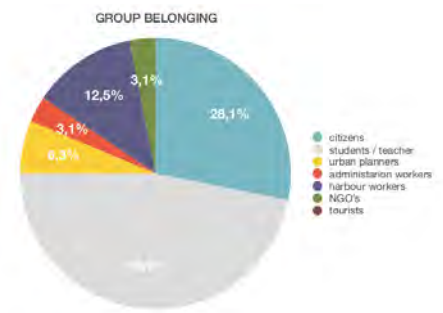

Fig. 49. Group belonging
Source: E. Skiba

Behavioural mapping proved that both spaces are intensively used by all citizens, and they are places of culture and values exchange. In both places the quality of the spaces should be improved to respond to the needs of theirs users. In Gdansk the priority, should be to reduce number of obstacles like high kerbs, or uneven pavement. They are causing problems not only for handicapped but also for people with pushchairs or in-line skaters. Local development plan for Brzezno pier is not indicating spatial accessibility for all users. Thus this could be considered as the main disadvantage of Gdansk spatial management in this place.

Since the local development plan give just general remarks how the public space should look like, but it do not have any stronger influence on its shape or design, tools such as local development plans for public spaces would be helpful. Introducing improvement in public spaces would not depend on the goodwill of the commune. Nowadays, cities can establish plans for public spaces, but they are usually general remarks on small architecture for whole city; they do not have strong legislative impact on the space.

3.7. HUMAN VALUES IN GDANSK AND GDYNIA - APPENDIX

3.7.1 PRELIMINARY INFORMATIONS

Implementing the project within the Mentor & Students Research Lab in the two coastal cities of Gdansk and Gdynia, from 4 April 2016 to 23 June 2016 there was carried on a survey to know the values as motivational constructs (Brzozowski, 2002), of the inhabitants regarding the coastal cities and the sea itself. Organization of the study was based on the disclosure of the survey in electronic form on the website www.survio.pl. The main objective of the survey was to obtain information needed to design the development of the coastal cities of the Baltic neighbour. The respondents rated the quality of the life in coastal cities, their feelings and associations to the sea by answering 23 questions, showing, what's really important for them.

3.7.2 ATTEMPT TO RESEARCH

- Printed survey received 82 responses.
- Gender of the respondents: 39 men and 43 women took part in the survey.
- Respondents belonging to different social and cultural groups: citizens, students, urban planners, government administrators, harbor workers, NGOs workers and tourists.
- It should be noted that up to 171 questionnaires were not completed and have not been taken into account when analyzing the results.
- Age of respondents: Most people who filled out the survey, was in the age groups 36 - 45 years and 22 - 35 years.
- Respondents: residents of Gdansk (49.9%) and Gdynia (51.1%).

3.7.3. ANALYZIS OF RESPONDENTS ANSWERS

An interesting observation was the answer to the question: which sea did you imagine when answering? Most of people answered Baltic Sea (71 people from 82) what show us how citizens are attached to it. It is also visible in question nr 2 where they had to choose between two opposite answers. They think that sea is wide, pleasant, close, romantic, interesting, plentiful, pure, significant, native and so on.
To see how diverging approaches to the subject have different population groups we analyzed the answers for citizens, students, urban planners, government administrators but also for harbor workers, NGOs and tourists.

4. HOW CREATE MULTICULTURAL COASTAL CITIES?

The idea of multicultural city is a way of being open. Not only open for different cultures, but also open in the process of administration of the shared goods. One of them is public space. Creating urban policies that are established to fulfill the needs of all the citizens should be the aim for all of the municipalities. Gdansk and Gdynia are multicultural cities when considering only the aspect of living in the same neighborhood representatives of many cultures. When other aspects (such as the culture of management, respecting the right of the citizens to decide about the form of their common spaces, personal values, individual preferences, such as connection to the sea as the specific condition in Gdansk and Gdynia and other factors that are escalating multiculturalism) are being tested, these cities are not multicultural and they do not answer to theirs citizen's needs.

Despite the cultural variety and tradition that is a repercussion of the history of the cities, it is more and more challenging to obtain idealistic cohesion of the city. It is visible mostly in three aspects: cultural, social and architectural. A lot is being done in the field of celebration the differences and providing knowledge about approaches of various cultures. However, a lot must be done in the area of introducing new facilitations to provide the access to information and space for everyone. The Council of the city of Gdansk has just adopted the local law setting the Model of Integration of the Immigrants. The main goal of it, is to provide better quality of life and equality in access to among others: information, education and healthcare for every person that lives in Gdansk. The program is focused on social, not spatial issues.

There is no major interest in the process of social cohesion. Being involved in actions to share challenges and opportunities is not common among the citizens. The information about the possibility to be part of some decision making process is spread, but the channels of communication are sometimes inappropriate to the scale and importance of the action. The belonging to the space is also not visible during the fieldwork, as there are very few occurrences that gather local people as a community, even during everyday actions in the neighborhood. The municipality of still developing cities, such as Gdansk, Gdynia and other ones with complex history - also in relation to the regime and other political changes, could take an example from Copenhagen, where the idea of multiculturalism is well known and being implemented for many years.

Gdansk's and Gdynia's plans for the future are mostly visible in the strategic documents. The cities are sharing the vision of the future due to the neighborhood, shared infrastructure and multiple other connections and dependences. Together with the contiguous city – Sopot, they have started actions to construct a strategic document which aim is to coordinate the work within the most essential areas.

Some of these areas, such as coastal recreational spots, are already taken into intensified consideration and local law was created to construct rules of building and management of the land there. The research of documents regulating these arrangements in similar places in Gdansk and Gdynia were compared to find the differences in land management policy. The differences are not very vast, since both documents are based on the Polish law of a higher order. If we take a closer look at the rules in Gdynia, they are stricter: with exact locations and shapes of some elements already set, established amenities for handicapped, different from the current indicators for management of that place and some other regulations. Gdansk's vision for the place is more open to flexible solutions, which can be used for or against the overall public space management in action there.

That policy was examined in field to find out if the places work in the way they were planned to and if there is a place to walk, to sit, to stop, to stand, to observe, to listen and to talk due to Gehl's

determinants of successful public space. There were a lot of people in both places at the time of the probes doing multiple actions, such as: walking, sitting, eating, talking, running, staying, skating, riding a bike, buying goods, playing and taking care of the children. The most visible differences were in the number of users of the public space (twice as much in Gdansk) and in the percentage of bikers in the area (much more in Gdansk). The main activity was in both cases: walking. The overall results are after all very similar to each other.

More differences were visible in the approach of urban planners of each city. Their values varied just a slightly, introducing such values as: diversity, seaside location, harbor, cultural events, the history of the city in Gdansk and modernism as an architectural style, harbor, urban structure, seaside location, number of green spaces and boulevards in Gdynia. The crucial dissimilarity was the vision of the future of both cities. The Baltic Sea is not taken much into consideration as influential for the future of Gdansk's urban planning management. On the other hand, the questionnaire showed an approach of only a few planners, thus the policy of the whole unit responsible for proposing the spatial law may differ. All of the respondents characterized of very high pro-ecological awareness.

The Baltic Sea is a much greater value for citizens of both cities. They identify it as: wide, pleasant, close, romantic, interesting, plentiful, pure, significant, native and much more positive-sounding terms. Whatever the sea means for them, 85% of respondents were thinking about the Baltic Sea specifically while answering. It shows the significance of this element in their life.

The sea was the element that shaped and let bloom both: Gdansk and Gdynia. It seems that this fact is sometimes forgotten in the process of thinking about those cities and their future. The tools for urban planning and management should be upgraded to be more flexible for various users needs. There is still a need for additional social and spatial programs and other actions that will let people be more engaged with their surrounding and have influence on its shape. Gdansk and Gdynia are currently working on their way of being multicultural cities. The direction is expected to be continued and improved due to multiplied needs of well integrated city at all levels.

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#MSRL2.0.

The MSRL 2.0. research is focused on the Baltic Sea Region (BSR) as a multidimensional urban phenomenon with Gdansk acting as a hub for the research teams. The idea of the MSRL 2.0. is to promote the collaboration of professionals and graduate and PhD students by bringing together the mentor(s) with a local research team sharing experiences and proposing strategic recommendations to strengthen sustainable urban development initiatives for BSR at the international, regional and local levels.