SMART & GREEN
THE FUTURE OF VISEGRAD CITIES
Presenting smart and green city solutions
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Three quarters of EU citizens live in urban areas (1), and 54.5 percent of the world’s population lives in urban settlements, projected to further grow in the near future (2). With a growing population in cities less and less space is available for nature, and thus Smart Cities can be an aid for both people and nature.

Smart Cities use technology to meet citizens’ needs and improve the efficiency of urban services. It is a concept that was developed in order to tackle modern challenges in urban settings. In search of more sustainable solutions to these challenges, an increasing number of cities are turning to solutions that are inspired by, supported by or copied from nature. Nevertheless, a smart city in our view is not only a city that develops its information and communication technology, but combines these with green, nature-based solutions, this
way turning environmental, economic and social challenges into innovation opportunities, not letting our cities turn grey. In Hungary and in the Czech Republic 70 percent, in Poland 60.2 percent, in Slovakia 54.4 percent of the population live in cities (3, 4, 5, 6). It is quite obvious that we need more liveable and greener cities, to improve our quality of life. New solutions are in many cases even more cost-effective than conventional ones (7).

"The potential of “smart and green” is enormous, not only in Uherské Hradiště but in every city, and Uherské Hradiště could be an exemplary city for middle-sized cities and many other ones. Smart and green innovations should go hand in hand – we perceive that being smart which is also green.

Marek Ščerba
Head of the Department of Transport Telematics, Transport Research Centre (CDV), Czech Republic"
GOVERNANCE

Smart city planning in Bratislava

Bratislava has elaborated a Concept for the smart city development in cooperation with experts from Vienna and Brno. There are 4 priorities of the smart city concept: the first is public participation, the second is the quality of public and social services, the third is transparency and the fourth are the long-term strategies of Bratislava. New technologies will be applied in mobility, traffic, energy, lighting, services for citizens and green management. The energy consumption of Bratislava should be reduced by 20% by 2020.

Within the project “Bratislava is preparing for climate change - a pilot project for rainfall precipitation and management in urban areas” several localities were established for retention,

Implementing the flower meadows into public open spaces (city parks, residential areas, at the administrative buildings) helps to increase the biodiversity in the urban environment.

Bratislava, Slovakia
Photo: Maria Bihunova
rainfall management and for supporting biodiversity in the urban environment. A great example is Bratislava Municipality Karlova Ves, a very densely populated urban area, consisting predominantly of prefabricated apartment buildings. The low construction quality of "concrete" buildings is accompanied with relatively poor quality of the open urban spaces and the lack of green spaces. These facts led Karlova Ves, as the first municipality in Slovakia, to calculate its carbon footprint. One of the possibilities to decrease the carbon footprint and in the same time to increase the biodiversity is the differentiated green spaces management, which Bratislava Karlova Ves started to implement in 2016.

Organica Water creates innovative smart city solutions for wastewater treatment, which is based on natural systems and has a smaller physical footprint compared to the traditional wastewater treatment plants. It is an innovative and sustainable approach to treat sewage locally by creating a botanical garden-like environment on the spot instead of pumping the sewage through extensive costly pipelines under the city outside the center to large, smelly, and inefficient wastewater treatment plants. The enhanced biological solution of treating sewage is not only cost-effective, making possible water reuse for irrigation, but also brings healthier environment to the citizens living in the cities with rapidly growing populations.
IDEAS IN PRACTICE - CZECH REPUBLIC

ENVIRONMENT & ALTERNATIVE ENERGY

Smart alternative energy project of the city of Písek

Písek was the first Czech city to officially embrace the “smart city” concept. The smart strategy rests on three pillars: intelligent mobility, intelligent energetics & services and integrated infrastructure and ICT. Besides a number of smart solutions already adopted, the city has recently taken steps to mitigate inefficiencies in its water supply grid, which should annually save around 3 million liters of water, by installing pressure and sediment sensors into pipelines. On the opposite end of the spectrum, Písek also decided to improve its treatment of sewage water to reduce costs of disposal and potential environmental impacts of sludge dumping. Using a state-of-the-art sludge utilization plant, sludge will be incinerated in a closed cycle without any undesirable byproducts, only water vapor and small amounts of ash will remain. Furthermore, these sanitized ashes will then be used as a component for the production of fertilizers in accordance with Czech and European laws. The sludge incarceration plant will be energy self-sufficient and will even be able to power the surrounding buildings of the water purification plant. By employing this technology, the City of Písek will annually save around 1.8 mil CZK in costs related to sludge disposal and if a LIFE grant application is approved, the initial investment is expected to return in 9 to 11 years.
We want to motivate people to separate waste

Miloslav Šatra
Head of the Department of the Environment in Písek, Czech Republic

As a citizen of Wrocław I get to the city and notice that it is less and less friendly to its inhabitants - high concentration of pollutants in the air, particularly very dangerous benzo[a]pyrene, growing and thickening of urban development at the expense of green areas force us to use solutions, which are available even in such conditions - like green roofs or living walls.

Katarzyna Wróblewska
PhD from Wrocław University of Environmental and Life Sciences, Poland

Trafostacja / Transformer - “ecological art” project

Trafostacja / Transformer - “ecological art” is a project realized in the framework of activities related to the European Capital of Culture in Wrocław, 2016. The author, Joanna Rajkowska is an artist creating installations, mainly in public spaces. Polish Green Roof Association has been invited to the project as green infrastructure specialists. The project brought together residents of Wrocław, mostly from the nearby settlements.

The purpose of the project was to show how old, damaged buildings (present in each city) may become attractive places, and at the same time raise the biodiversity value of the space. Evergreen climbing plants, such as ivy (Hedera helix) will make the temperature under the leaves slightly higher than in exposed locations. This is beneficial for insects, which prefer such places during their winter lethargy. This will attract birds, which may also begin to nest. In addition, as ivy blooms in autumn, the nectar from the flowers is food for bees and other insects at the time when other species are already after the flowering season. In this way, the transformer station becomes a place to live throughout the year.
3 WHAT NEXT?

Why should we use smart and green solutions?

- They improve our health and the overall quality of our lives;
- Create self-sufficient cities energy wise;
- Mitigate urban heat island effect;
- Improve water, soil and air quality;
- Make our cities more beautiful;
- Keep us fit by providing more opportunities for recreation;
- Increase real estate values.

What is stopping us from having smarter, greener cities?

- Mental barriers – preventing the introduction of innovative technologies in conservative surroundings
- Legislation – lack of standards and regulations, multiple layers of jurisdiction;
- Citizens/users themselves – absence of awareness about the benefits;
- Decision-makers – might be challenging to convince to make a change;
- Lack of a holistic approach – harmonization with other sectors is essential;
- Budget – sometimes there is a will, but it is difficult to find a way;
- Time – making significant progress is time-consuming.
What can we do about it?

- Communicate the advantages of smart, nature-based solutions in comparison to the strictly technical ones to all stakeholders, including the more conservative industries;
- Advocate the change of the existing regulations and dedicating more money from the budget for smart solutions;
- Include citizens in planning phases, let their voices be heard;
- Present green solutions that are cheaper than the existing ones when talking to the decision-makers;
- Establish long-term strategic partnerships;
- Gain knowledge – visit conferences, exchange ideas and experiences: the tools are already there and they might be easier to implement than you think!

All of these initiatives not only create a better quality of life for citizens in the cities which are becoming more and more populated, but enable city administration to significantly reduce their costs, as well as contribute to our ecosystems and give something back to nature; not forgetting nature can only provide us its life supporting systems if we enable it, not only outside in national parks, but also right in our cities.

The benefits of green solutions are facts. We are losing our natural resources. If an innovation focuses on green, it will immediately support our future which can be even in our generation. The climate changes so dramatically. We have no other way than to involve green to an innovation and being smart. One of the most important parts is environment and our green places, which are fading out to grey.

Gyula Fekete  
Senior GIS Expert at Road Management Co. of Municipality of Budapest, Hungary

Significant negative effects could be seen due to global climate change, particularly in the increasing number of heat days, existence of urban heat islands, prolonged periods of drought, deficiency of precipitation, increasing flooding situations, including floods from more intensive heavy rainfall.” Libuše Murínova (Department of Environment and Transport, Zvolen City Municipality, Slovakia) predicts growing financial expenses for city municipalities due to the above mentioned situation.

Libuše Murínova  
Department of Environment and Transport, Zvolen City Municipality, Slovakia
REFERENCES


SMART & GREEN
THE FUTURE OF VISEGRAD CITIES
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© PUBLISHED BY
CEEweb for Biodiversity, 2018

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of “Smart and Green – the future of Visegrad cities”:
CEEweb for Biodiversity (Hungary)
Polish Green Roof Association
Association for Garden Design and Landscaping (Slovakia)
Czech Landscape Gardening Association

The project
SMART AND GREEN - THE FUTURE OF VISEGRAD CITIES
was funded by the International Visegrad Fund
and by the European Union.
The project was realised in 2017.

Smart and Green – The Future of Visegrad Cities
The publication includes further smart city innovations from cities of the Visegrad countries such as Budapest (Hungary),
Warsaw, Wrocław (Poland), Bratislava, Trnava, Nitra, Zvolen (Slovakia), Brno, Litoměřice, Písek, Uherské Hradiště (Czech
Republic) in 4 categories: Governance, Society & Living, Mobility, Environment & Alternative Energy.