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Challenges and Opportunities for a Sustainable Development
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Factors of development of northern smart cities in the concept of sustainable development

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The European Commission defines
«A smart city as a place where traditional networks and
services are made more efficient with the use of digital
solutions for the benefit of its inhabitants and business».

Experience from smart cities that is being actively discussed,
such as Smart Forest City Cancun, Sidewalk Toronto, Smart
City Belmont, Karle Town Centre, Smart City Neom, and
others, is useful, but requires huge refinement and
adaptation.



Development factors in relation to the future of northern cities, in our opinion, are:

- The first factor, no matter how traditional it is, is global warming.
- The next trend is the trend towards sustainable, resilient, inclusive, and equitable cities with zero circularity.
- There is a need for interaction of urban facilities, residents, tourists, business with the surrounding nature.
- The third trend is development of telecommunications, satellite communications, satellite high-speed data transmission systems, the use of unmanned technologies, drones, and autonomous vehicles, Big Data.
- Increasing the influence of civil society, the factor of socialization, and the desire of people to the team, to become part of the community, increasing civic activity.
- Unprecedented widespread aging.
- The need for skilled and unskilled labor will drive global migration.

Development factors in relation to the future of northern cities, in our opinion, are:

- Reducing investment in fossil fuel technologies and redirecting them to four basic technologies that will determine global economic: Information technology; New production and automation technologies; Technologies for the safety of vital resources; Health Technologies.
- The demand for knowledge about the Arctic is growing, so the development of educational and research centers is in the future.
- The development of Arctic tourism, the use of the extreme northern location as a point of attraction for tourists and a tool for commercialization.
- Formation of a high-quality urban environment through the renovation of northern cities, the creation of a new architectural concept, new types of houses, new building technologies, social facilities, infrastructure, and public spaces.
- Development of local, intra-Arctic production, use of local resources, building materials, energy resources, and products.
- Development of block chain technologies.

The next trend is the trend towards sustainable, resilient, inclusive, and equitable cities with zero circularity

Since the late 1980s, the Nordic countries have been basing their national strategies on the principles of "sustainability", and since 2014 they have reoriented urban programs towards the development of smart sustainable cities. In the Sustainable Development Report 2022, Finland, Denmark, Sweden, and Norway in the ranking occupy the first four places.

«Cities in the global North have contributed the most to climate change and biodiversity loss, and they have the resources to adapt to some of their impacts» [Global Environment Outlook]

There is a need for interaction of urban facilities, residents, tourists, business with the surrounding nature:

- The smart city of Kristiansand (Norway) takes the needs of citizens as a basis and uses new technologies to create a better city for everyone.
- In Hammerfest (Norway), a grandiose program has been implemented to transform the coastal zone in accordance with the principles of sustainable development, the interaction of objects with the natural environment.



There is a need for interaction of urban facilities,
residents, tourists, business with the surrounding nature:

- The Canadian model of Smart City (Yellowknife City and Nunavut Territory) is being developed based on the "Open Smart City" principles such as:
 1. Open data.
 2. Open source software.
 3. Open, ethical, and transparent governance.
 - 4 Open people who are finite Users.



Increasing the influence of civil society, the factor of socialization, and the desire of people to the team, to become part of the community, increasing civic activity.

There is a need to create a wide variety of places where people can gather to create, communicate, play, learn, and have fun.



For example, consider the Norwegian Hammerfest which is the northernmost port city in the world with a population of about 10 thousand people. His "Arktisk Kultur Centre" is planned as a multi-purpose cultural center, a multifunctional building that can be transformed into creative studios, creative workshops, theater, dance hall, cinema hall, and conference hall.

Digital platforms in smart cities are developing civic engagement tools that allow citizens to participate in crowdsourcing projects, voting and decision-making, reporting various minor problems, and applying for services.

The Qlue system (Jakarta) as a set of solutions for a smart city offers several tools:

- a platform that allows citizens to report problems (Qlue MyCity);
- a dashboard for representatives of the city administration (Smart Governance Dashboard);
- a sensor-based platform for real-time monitoring of environmental quality indicators with predictive capability (Smart Environment);
- a platform for traffic analysis based on a video surveillance system (Smart Mobility);
- service for collecting information from social networks based on semantic analysis (Smart Media Analysis);
- security platform based on a video surveillance system to search for missing people and cars (Smart Safety) (Smart Cities: Digital Solutions For A More Livable Future).

The development of Arctic tourism, the use of the extreme northern location as a point of attraction for tourists and a tool for commercialization

Norway has the largest concentration of fjords in the world.

- Honningsvåg (Norwegian: Honningsvigi) is a city in Norway, in the county (province) of Finnmark, which successfully uses this natural factor. The port of Honningsvåg is visited by many cruise liners, in addition, Hurtigruten ships make a stop here, following along the coast of Norway on the Bergen-Kirkenes route.



The development of Arctic tourism, the use of the extreme northern location as a point of attraction for tourists and a tool for commercialization

Norway has the largest concentration of fjords in the world.

- The brand «Northern City of the World», and «The Northernmost City in the World» are registered as separate trade global brands owned exclusively by Hammerfest.



Formation of a high-quality urban environment through the renovation of northern cities, the creation of a new architectural concept, new types of houses, new building technologies, social facilities, infrastructure, and public spaces

Landscaping of northern cities based on climate control.

In the city of Anchorage (Alaska, USA), contrary to popular belief about northern cities, there are more than two hundred parks with a total area of about 45 thousand square meters.



Formation of a high-quality urban environment through the renovation of northern cities, the creation of a new architectural concept, new types of houses, new building technologies, social facilities, infrastructure, and public spaces

Development of smart transport infrastructure and development of logistics.

For example, in Hammerfest, the super-bridge «Kvalsund Bridge» has already been built - the world's northernmost suspension bridge, and under it, the world's first tidal power source has been installed.



Development of local, intra-Arctic production, use of local resources, building materials, energy resources, and products

Even despite the powerful development of transport and supplies, cities must provide for themselves: growing vegetables, as cities are heated in most parts of the city and heat can be reused.

Interesting is the experience of Iceland in the development of the sharing economy, that is, the sharing of transport, and the exchange of resources in the form of crowdfunding or crowdfinvestment, and the distribution of clothing, and food



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Thank you for your attention!