Smart city strategies for Moscow and Kazan development
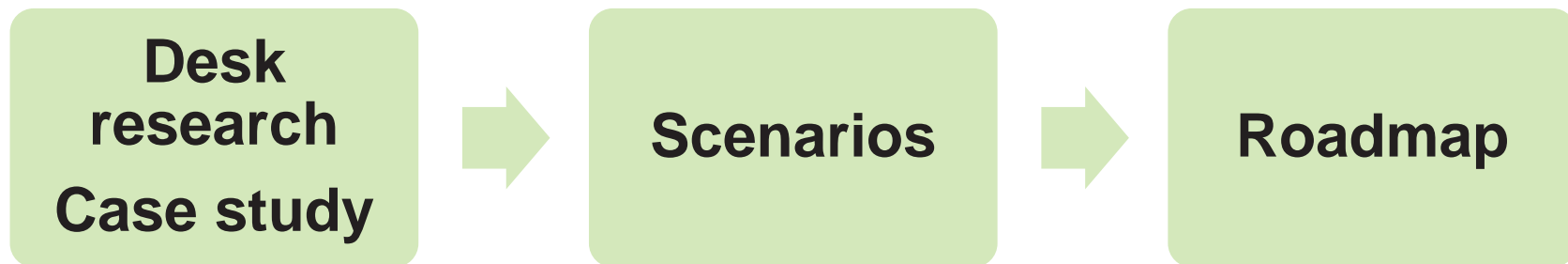
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International Seminar on "Towards Smart Sustainable Cities – Integrated Approaches"
Expo 2017, Astana, Kazakhstan, 15-16 June 2017

Institute for Statistical Studies and Economics of Knowledge

Desk research
Case study → **Scenarios** → **Roadmap**

Tatarstan and Moscow are ranked 1st and 2nd in the Russian Regional Innovation Development Rating developed by HSE in 2014

Kazan

Capital of Tatarstan Republic
Population – 1,1 mln
Square – 452,3 sq km

Moscow

Capital of Russia
Population – 12,3 mln
Square – 2511 sq km

Finalist of the prize "Word Smart City Awards"

Regional Innovation Development Rating, 2014

Регион	2014							Изменение ранга по РРИИ: 2013→2014	2013	
	Группа по РРИИ	Ранг по РРИИ	РРИИ	Ранг по ИСЭУ	Ранг по ИНТП	Ранг по ИИД	Ранг по ИКИП		Ранг по РРИИ	Группа по РРИИ
Республика Татарстан	I	1	0.5625	3	17	2	1	1	2	I
Москва	I	2	0.5530	1	4	11	11	-1	1	I
Санкт-Петербург	I	3	0.5413	2	2	5	23	1	4	I
Республика Мордовия	II	4	0.4930	32	59	1	3	14	18	II
Калужская область	II	5	0.4812	11	12	27	2	-2	3	I
Нижегородская область	II	6	0.4749	10	3	12	28	2	8	II
Томская область	II	7	0.4652	13	5	10	16	-2	5	II
Чувашская Республика	II	8	0.4645	49	32	3	5	-1	7	II
Хабаровский край	II	9	0.4498	8	58	7	4	6	15	II
Пензенская область	II	10	0.4411	16	31	15	8	-4	6	II
Новосибирская область	II	11	0.4389	21	7	41	7	-2	9	II
Красноярский край	II	12	0.4382	19	19	22	6	0	12	II
Свердловская область	II	13	0.4263	14	13	14	26	-3	10	II
Липецкая область	II	14	0.4261	52	53	6	9	7	21	II
Республика Башкортостан	II	15	0.4200	15	11	17	34	2	17	II
Ульяновская область	II	16	0.4137	27	1	50	39	-5	11	II

Source: Regional Innovation Development Rating, Higher School of Economics

Objectives of Moscow development as a smart city*

Improvement of the urban environment quality

A "Cosy City": full-fledged environment for active life and work for all generations

B "Creative City": a variety of social life, in particular the density and access to communication

C " Safe City": the reorganization of the road network and street lighting, improved bacteriological and virological protection

D "Green City": health disease prevention, the purity of water, air and soil, the effective management of waste, aesthetic quality of the urban landscape

E "Energy Efficient City": a new power grid structure, smart energy metering systems.

Creation of a new architectural and artistic appearance of the city's historic center

F "Unloading center": the withdrawal of non-core facilities outside the historic center and the conversion of areas

G Complex reconstruction of the historic core infrastructure

H Improved utilization of cultural and historical core in the center of the city

*according to the Moscow socio-economic development strategy until 2025

4

Drivers

- Improving City Infrastructure: Energy, Water and Transportation Systems
- Enhancing the Cities' Global Attractiveness for Business and for Economic Development
- Creating a More Attractive City and Improving the Quality of Life

- IT Department
- Department of Transportation and Development of Road Transport Infrastructure
- Bussiness
- Department of Economic Policy and Development
- Public organizations
- Department of Housing and Communal Services and Improvement
- Department of Media and Advertising
- Health Department

Barriers

- Community not engaged or at the same readiness
- Inability to align funding for a project up front
- Lack of clarity of the benefits

5

Moscow priorities for smart city

1. Quality of Life: healthcare, education and social protection

Conversion of state services into electronic format and creation of new electronic services

Implementation of information-and-communication technologies (ICT) in education, health care, and social sphere

Development of the universal electronic card infrastructure

Promotion of interactive, open, and efficient dialogue between Moscow city executive authorities, citizens, and business representatives

2. City Management: public service quality and promptness

Enhancement of the public utility service quality by means of ICT application

Enhancement of the city management efficiency based on ICT implementation

Upgrade of the level of inhabitants safety assurance by means of IT application

Creation of the ICT component of the Intelligent Transportation System

Enhancement of the efficiency of performance by the city executive authorities of their functions by means of ICT application

3. IT Infrastructure: equal access to the modern ICT environment

Creating conditions for efficient development of information-and-communication infrastructure of the city

Development of the information-and-communication infrastructure of Moscow city executive authorities and their subordinate institutions

Rendering telecommunication services for the municipal executive authorities and their subordinate institutions

Organization of efficient development and operation of information systems and resources of Moscow city executive authorities

Support of the city safety assurance system operation (CCTV recording in building blocks) in line with the service model

Provision of the centralized arrangement of the municipal information systems and resources on the basis of the integrated Data Processing Center

4. Media and Advertising: information availability to public; city information
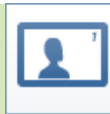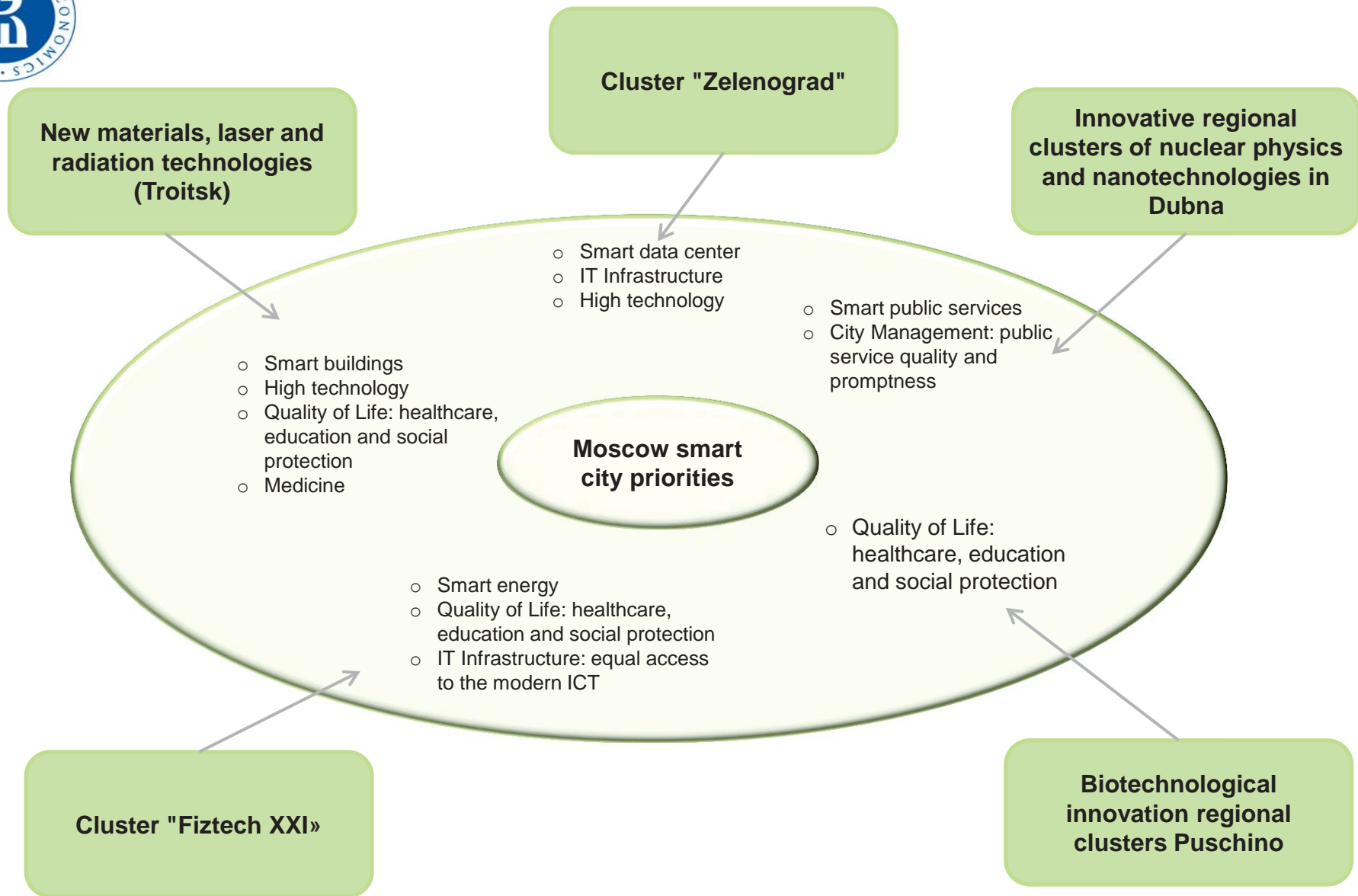
Carrying out integrated analysis and assessment of applicability and relevancy of the existing Moscow city information systems and resources

Developing requirements to the solution architecture within the framework of the system project of the Program implementation
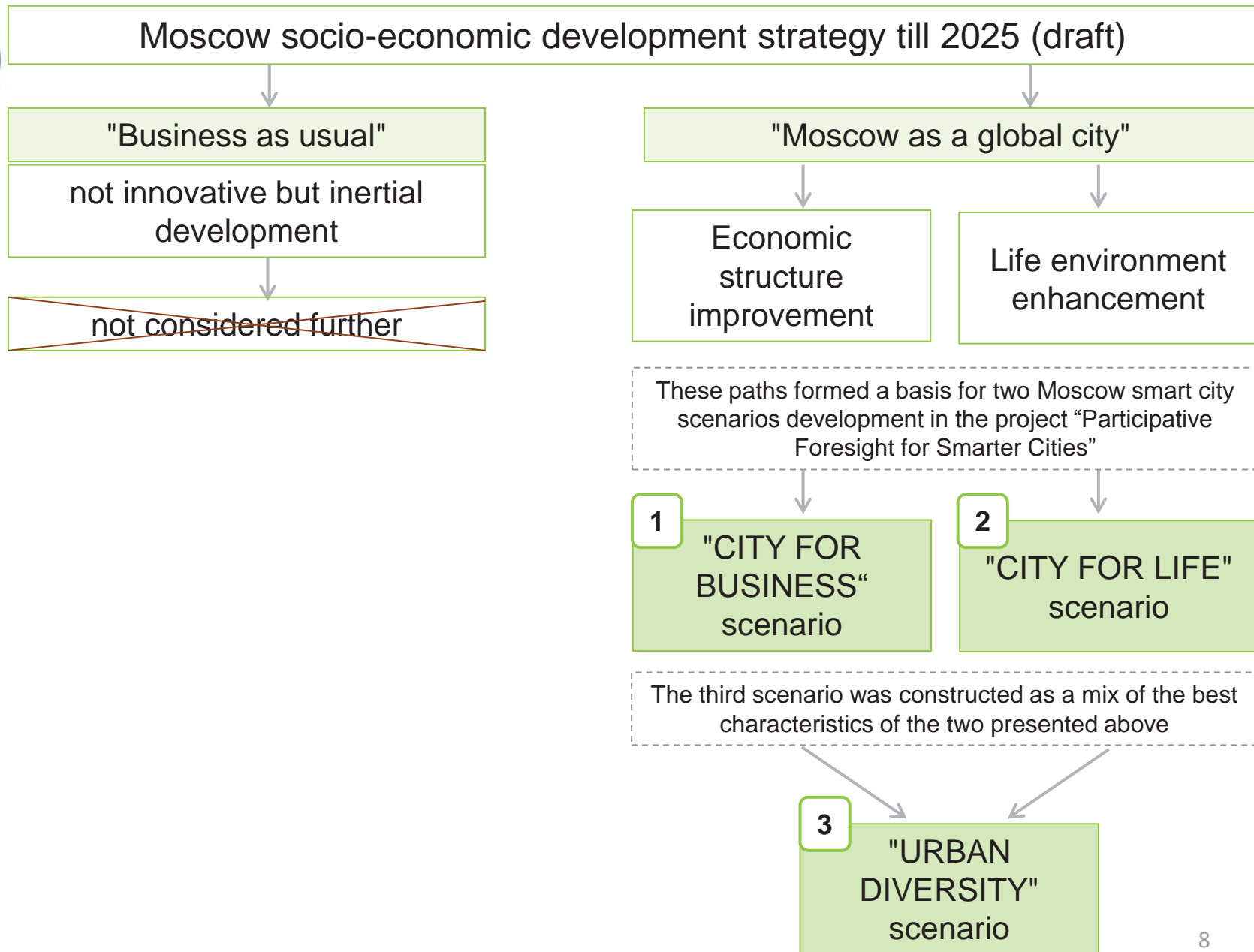
Integrated simulation of the processes of implementation of functions of Moscow city authorities and institutions, and description of their targeted state

Development of the risk management system, including development of the package of risk prevention measures

Cluster "Zelenograd"

New materials, laser and radiation technologies (Troitsk)

Innovative regional clusters of nuclear physics and nanotechnologies in Dubna

- Smart data center
- IT Infrastructure
- High technology

- Smart public services
- City Management: public service quality and promptness

- Smart buildings
- High technology
- Quality of Life: healthcare, education and social protection
- Medicine

Moscow smart city priorities

- Quality of Life: healthcare, education and social protection

- Smart energy
- Quality of Life: healthcare, education and social protection
- IT Infrastructure: equal access to the modern ICT

Cluster "Fiztech XXI»

Biotechnological innovation regional clusters Puschino

Moscow smart city scenarios development

Moscow socio-economic development strategy till 2025 (draft)

"Business as usual"

not innovative but inertial development

not considered further

"Moscow as a global city"

Economic structure improvement

Life environment enhancement

These paths formed a basis for two Moscow smart city scenarios development in the project "Participative Foresight for Smarter Cities"

1 "CITY FOR BUSINESS" scenario

2 "CITY FOR LIFE" scenario

The third scenario was constructed as a mix of the best characteristics of the two presented above

3 "URBAN DIVERSITY" scenario

Moscow smart city scenarios

1 "CITY FOR BUSINESS" scenario

➢ Modernization of business institutional environment through the use of IT technologies
➢ Improvement of industrial infrastructure (industrial sites, technology parks, etc.) and measures (including budgetary ones) to stimulate the development of key industries and clusters

2 "CITY FOR LIFE" scenario

➢ Enhancement of the urban environment quality through the use of IT technologies
➢ Particular attention in this scenario is paid to ecology, security, creation of intensive growth points and competition in the spheres of education and health, housing policy

3 "URBAN DIVERSITY" scenario

➢ Integrated development of both living conditions and business
➢ The smart city concept in this scenario implies its development both within the existing city and in the new territories. So the development of the smart city follows two directions:
  1. In the existing territory of Moscow some districts are developed for business, the other —for life
  2. New territories of Moscow can be constructed as a complex smart city, in which comfortable conditions for life and business are created

Vision for Moscow smart city scenarios

Priorities and sub-priorities importance in scenario

Vision gems

Priorities

Sub-priorities

The scenarios vision will form the basis for Moscow smart city roadmap

The most important priorities, sub-priorities and vision germs in scenarios

1 "CITY FOR BUSINESS" scenario

> ➢ Innovative clusters development for smart city by means of optimised power consumption, avoidance of energy waste, efficient use of infrastructure, cleanness, etc.
> ➢ City Management: the creation of the ICT component of the Intelligent Transportation System including ecological, less individual traffic, local products, optimised connection to other centers, intelligent mobility self-driving cars, etc.
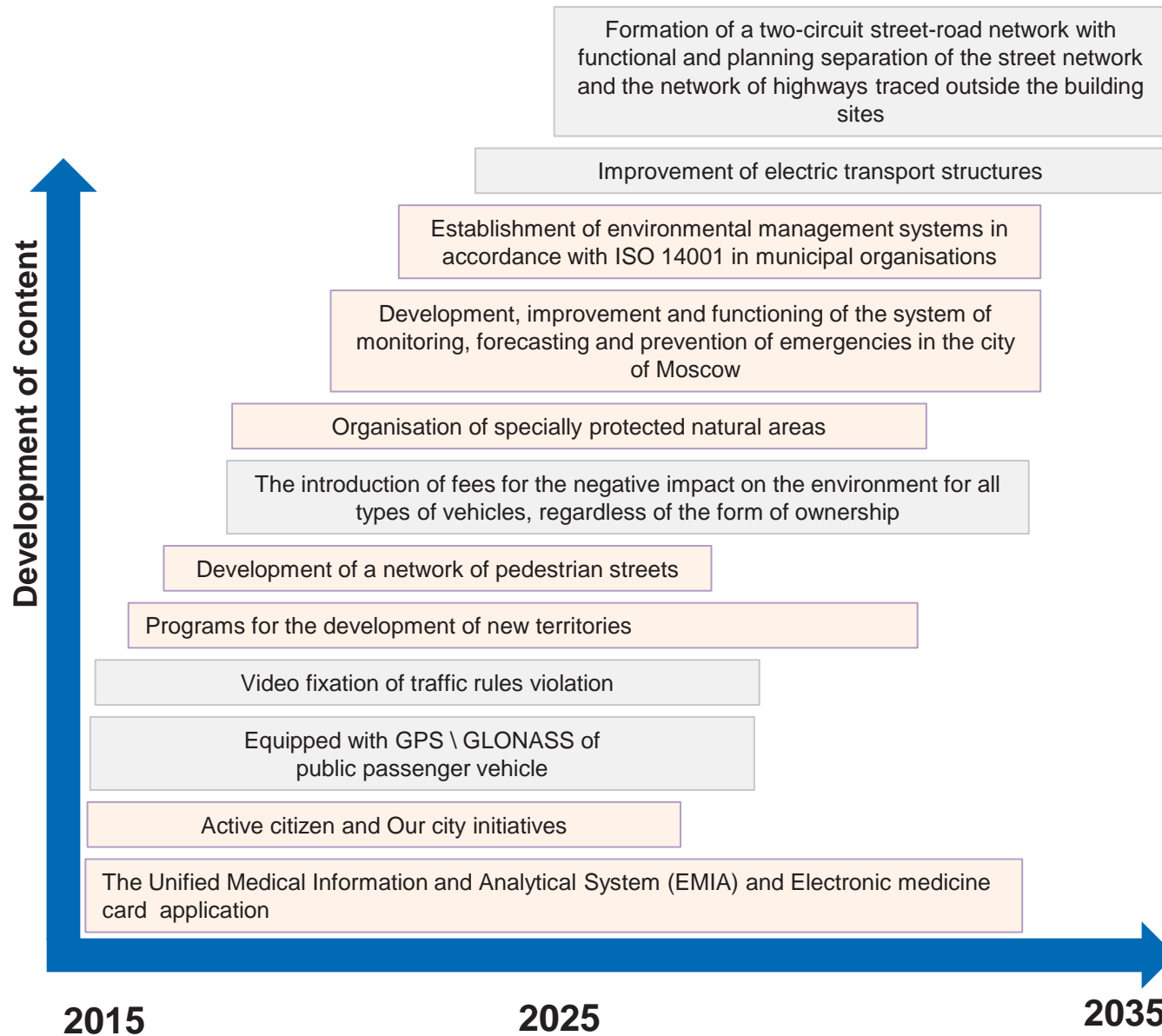
2 "CITY FOR LIFE" scenario

> ➢ Life quality improved by more flexible working times and models, smart education care, self-screening health, etc.
> ➢ Creation of the ICT component of the Intelligent Transportation System by means of noiseless city, sharing models, bicycle city, individual public transport, etc.
> ➢ Enhancement of the public utility service quality with a help of optmisation of public recovery areas, personal data on chip and maintaining privacy

3 "URBAN DIVERSITY" scenario

> ➢ Transport and life quality priorities are implemented through healthy quality food, social interaction, self-screening health, ecological traffic, cross-linking of infrastructure, etc.
> ➢ The next steps of the urban diversity scenario realisation include innovative clusters and energy efficient new areas development by means of optimised power consumption, efficient use of infrastructure, 3D modelling of energy efficient districts, smart grid, zero-waste society

Scenario «Urban Diversity»: key milestones

Development of content →

Formation of a two-circuit street-road network with functional and planning separation of the street network and the network of highways traced outside the building sites

Improvement of electric transport structures

Establishment of environmental management systems in accordance with ISO 14001 in municipal organisations

Development, improvement and functioning of the system of monitoring, forecasting and prevention of emergencies in the city of Moscow

Organisation of specially protected natural areas

The introduction of fees for the negative impact on the environment for all types of vehicles, regardless of the form of ownership

Development of a network of pedestrian streets

Programs for the development of new territories

Video fixation of traffic rules violation

Equipped with GPS \ GLONASS of public passenger vehicle

Active citizen and Our city initiatives

The Unified Medical Information and Analytical System (EMIA) and Electronic medicine card application

2015   **2025**   **2035**

⬛ **Intelligent Transportation System**   ⬜ **Quality of Life**

New territories of Moscow constructed as a complex smart city (an example)
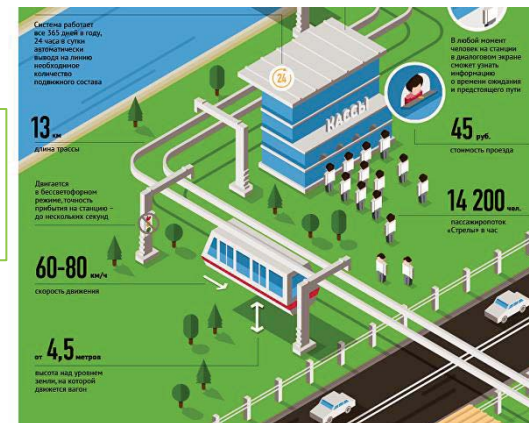
Micro district "Ilinskoe-Usovo" construction in the west of the Moscow region
(first stage – 2021)

- ➢ Intelligent system of city lighting control
- ➢ Remote access to services
- ➢ Interaction of transport, engineering and other urban infrastructure systems

- ➢ "Air subway" construction

- ➢ The project will create about 28,000 jobs, which will relieve traffic flows, reduce pendulum migration and form a new growth point in the west of the Moscow region.

Kazan Smart City as an urban development project

VISION

The **VISION** of Kazan Smart City is to transform it into an international business hub and gateway to Russia

MISSION

Kazan is a global, smart sustainable city, a center of excellence for **international business** and knowledge development that will create a sustainable economic region and **high quality of life**

Design Principles

A Eco-urbanism

- Urban development will coexist with natural environment
- Natural vegetation will be preserved
- Assurance of high environmental quality embedded into blueprint of planning

B Smart growth

- Kazan Smart City will adopt smart growth principle
- Development designed with varying intensities
- Encouragement of mixed-use development that will be integrated with transportation

C Smart location

- Kazan Smart City has synergistic influence to the regional and local economy
- Creation of clusters of economic activity that will benefit local business as well as provide opportunities for the emergence of new economies

D Low carbon

- Emphasis on design solutions that will reduce carbon emissions
- Environment, transportation, infrastructure, and buildings all designed to reduce carbon emission

E Inclusivity and identity

- Kazan Smart City will provide for inclusivity, with employment opportunities, choice of housing, access to education and community facilities
- Strong emphasis on local identity

Drivers

1) ***Strategic location***: Kazan International Airport connects Europe, Central Asia & Middle East
2) ***Large infrastructure development projects***:
   - a ring road is being built around the perimeter of Greater Kazan
   - federal railway development program

Tatarstan Investment Development Agency (supervisor)

Tatarstan Development Corporation (operator)

Straits Consulting Engineers

AJM Planning & Urban Design Group (master plan developer)

Barriers

- Community not engaged or at the same readiness
- Lack of clarity of the benefits

Kazan priorities for smart city

1. Medicine

- Internationally-operated teaching hospitals
- diagnostic and research centers,
- medical technopark
- medical equipment and biomedical manufacturing

2. High technology

Special Economic Zone– the core of Kazan Smart City's high technology cluster (tax preferences)

3. Education

World-class research and educational facilities in the Knowledge and Education Precinct. The core of this precinct – the Multivaristy campus will aggregate departments from leading global universities (with an international school, a medical and research center, and an intellectual property development research center)

4. Tourism

International Exhibition and Convention Center, Art museum, show rooms, and parks

Conclusions and further research

Case study analysis identified the priorities similar for Moscow and Kazan: **healthcare and medicine, IT technologies in education**.

Specific priorities for Moscow: **City Management; Media and Advertising**

Specific priorities for Kazan: **High technology; Tourism**

3 scenarios of Moscow smart city is developed: Business City, City for Life and Urban Diversity

Further research

Kazan smart city scenarios development

Roadmapping for Moscow and Kazan

Thank you for your attention!

Cluster	Cluster "Zelenograd"	Innovative regional clusters of nuclear physics and nanotechnologies in Dubna	Biotechnological innovation regional clusters Puschino	Cluster "Fiztech XXI»	New materials, laser and radiation technologies
Sector	Information technology and electronics	Nuclear and radiation technologies	Pharmaceuticals, biotechnology and medical industries	New materials	New materials
Technology and production important for the smart cities	•Micro- and nanoelectronic products •Electronic devices and equipment •Complex technical IT-systems	• Technical security •Nuclear Medicine •Composite products for transport •Complex technical systems	•Biotechnology for medicine •Pharmacology •Biotechnology in agriculture •Environment protection •Industrial biotechnology	•Pharmaceuticals and biomedicine •Iformation, communication and space technology •Energy efficiency, new materials and new equipment	•New material •Optics and photonics •Medical industry •Microelectronics and instrument making
Contribution to the development of smart city segments	•Smart data center •IT Infrastructure High technology	•Smart public services (smart street - street lights + public safety) •City Management: public service quality and promptness	•Quality of Life: healthcare, education and social protection •Medicine	•Smart energy •Quality of Life: healthcare, education and social protection •IT Infrastructure: equal access to the modern ICT	•Smart buildings •High technology •Quality of Life: healthcare, education and social protection •Medicine