



MINISTRY  
OF REGIONAL  
DEVELOPMENT CZ



# Smart Cities Methodology

Methodology for the preparation and implementation of the Smart Cities concept at the level of cities, municipalities and regions

Updated publication

[www.smartcities.mmr.cz](http://www.smartcities.mmr.cz)

The methodology for the preparation and implementation of the Smart Cities concept at the level of cities, municipalities and regions is based on the original Smart Cities Concept Methodology (available at [www.smartcities.mmr.cz](http://www.smartcities.mmr.cz)).

The methodology was updated in collaboration with members of the Smart Cities Working Group and with Jakub Slavík, MBA - Consulting Services.

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**Annex 4 Recommendations for drafting the SC concept**

# 1 Introduction to the updated Smart Cities concept methodology

## 1.1 What is a methodology and what is the purpose of updating the Smart Cities Concept Methodology (2015)?

In general, a methodology is a description of a repeatable process or procedures by means of which a set output or goal can be achieved. A methodology should answer basic questions: Who? What? To whom? Why? How? It should also include a definition of links to related methodologies, regulations, etc., as well as a way to evaluate the results achieved.

The updated Smart Cities Methodology is based on that general philosophy. The main part of the methodology introduces the reader to the basic terms, objectives and structure of the Smart Cities concept. Details are given in the annexes referred to in the text. In this document and in the annexes, the terms smart/intelligent carry the same meaning.

The methodology responds to the requirement of local governments and other actors to bring the material closer to its main users and tries to remedy the shortcomings of its original version - namely insufficient structuring and targeting at specific Smart Cities implementers, i.e. the problematic applicability in everyday practice, extensiveness and rather theoretical approach to the issue. In addition, the updated version is expanded to include some other useful insights, such as the comprehensively covered theme of green infrastructure of Smart Cities, and separate annexes that extend the subject to specific areas such as mobility, energy and ICT. The topic of financing, whether from subsidies or through private sources, is addressed in the follow-up Methodology of Smart City Project Financing and an overview of subsidy schemes that the Ministry of Regional Development (MoRD) regularly publishes on its website ([www.smartcities.mmr.cz](http://www.smartcities.mmr.cz)). There you can also search for all the MoRD information on the Smart Cities concept.

## 1.2 What is the Smart Cities concept?

The term Smart Cities means **the concept of strategic management of a city**, or municipality or region (for simplicity, hereinafter referred to only as "Smart Cities", "SC concept", "SC" without further distinction). The primary objective of SC is to ensure a good quality of life for residents, **where modern technology is used as a tool to influence the quality of life in the city and consequently to achieve the city's economic and social goals**. In doing that, synergies occur between the various activities and public services that make the city functional - especially transport, logistics, security, energy, management of buildings, etc. At the same time, the Smart Cities concept puts emphasis on both the hard and soft aspects of city life management and on the harmony between the city's "grey" and "green" infrastructure.

## 1.3 Two levels of introducing the Smart Cities concept

The Smart Cities concept is implemented on two main planes

- **a strategic document**, that gives the direction, objective and system to the Smart Cities development; it usually follows and is coherent with the existing strategic documents of the city; coherence must exist in particular with the strategic plan and through it with the land use plan, see Chap. 4 for more.
- **specific development projects**, by which this concept is delivered; where modern technologies are implemented, they may be either of research/ development nature (testing of not yet completed solutions in the city as a "live lab") or of investment nature (buying and deploying fully tested solutions).

This methodology deals adequately with both of these levels.

## 1.4 Who is this methodology for?

The methodology is intended for both city leaders and local government employees who prepare the strategies in the SC concept. The methodology should help to organize the building of a smart city, to specify the involvement of citizens in the various SC programmes, using investments in the city's infrastructure. The methodology can be used both for creating a framework SC strategy and in the implementation of development projects that deliver that strategy.

The methodology is always applicable in general terms, however, the city must respect its (socio-demographic, economic, political, etc.) specifics and know its baseline situation with defined locality issues.

**The Smart Cities concept methodology must focus not only on our large cities, but also on smaller and medium sized towns, while being reasonably applicable to residential units of all sizes.**

For the purposes of more detailed recommendations in this methodology (see annexes), a categorization of cities was proposed to reflect the basic size categories of settlements in the Czech Republic. The inclusion of a specific settlement in the appropriate category should not be strictly based on its population, it is important to take into account the functional typology of the municipality within the overall settlement structure (i.e. to what extent is it a centre for surrounding smaller settlements? how is its administration divided territorially? what other functions does the settlement provide to its hinterland?). The limit of 40,000 inhabitants has been chosen so as to embrace all statutory cities that have a well-developed urban public transport system and offer generally a wider range of services to a larger region. Category D mostly includes municipalities with extended powers or mandated municipalities, usually forming the core of microregions.

Category	Population	Note
A	over 150 ths.	Prague, Brno, Ostrava, Pilsen
B	40-150 ths.	larger settlements with developed urban public transport system, e.g. statutory cities
C	15-40 ths.	e.g. district towns
D	5-15 ths.	other administrative centres incl. smaller district towns
E1	1-5 ths.	villages
E2	up to 1 ths.	

## 1.5 A brief history of Smart Cities in the EU and the Czech Republic

The notion of "Smart Cities" started to be used and developed at European level mainly on the initiative of industry. In 2011, the industrial activity "Smart Cities and Communities" was established, exploring the link between transport and energy, and geared towards reducing their environmental demands. A year later, the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) launched its activity that already included information and communications technologies and gave the Smart Cities concept its basic structure.

This is not to say, however, that the term 'smart' did not exist before 2011 in connection with the application of diverse smart technologies in cities or regions. The proof is, among other things, the Czech Smart Region Vrchlabí, which was launched as a pilot project of smart energy networks in the Czech Republic and formed part of the transnational project Grid4EU already in 2010.

The first comprehensive strategic approach to the concept of Smart Cities appeared in the town of Písek, whose strategic document "Blue-Yellow Book Smart Písek" was created in 2015. Since then, many other smart cities have been developing in the Czech Republic, being more or less based on the Smart Cities Concept Methodology.

## 2 Four levels and sixteen components of Smart City

The smart city framework consists of 16 hierarchically arranged components that can be grouped into 4 consecutive **levels of Smart Cities**:

**A. Organization**, emphasizing the organization and system of city administration and its further development.

**B. Community**, emphasizing the promotion of community life and the individual citizen as part of the urban community, involved in its life and decision-making.

### C. Infrastructure

- consisting of urban mobility, energy and other urban services, together interconnected and supported by information and communications technologies - this "grey" infrastructure is embedded in the "green" urban infrastructure (see Chapter 3 for more),
- emphasizing synergies between the implemented technologies and a long-term approach to infrastructure development.

**D. The resulting quality of life and the attractiveness of the city**, which is the result and goal of the Smart Cities concept development.

Each level (A, B, C, D) consists of four components hierarchically arranged from the basic to the complex (1, 2, 3, 4), the sequence of which corresponds to the sequence of processes. The overall concept then represents a process for creating a smart city, and every project requiring public support should, if relevant, fulfil all 16 components.

### Four levels of Smart Cities and examples of their achievement:

SC Level	No	Component	Examples of delivery and related tools
<b>A: Organisation</b>	1	Political commitment	Smart city vision
	2	Organisation and responsibility	Designating a city government department and assigning personal responsibilities for the Smart City implementation
	3	Strategy / Action Plan	Developing a Strategic and an Action Plan to fulfil the vision <sup>1</sup>
	4	Cooperation and long-term partners	Establishing a working group composed of stakeholders (persons and organizations)
<b>B: Community</b>	1	activates and connects	An application/website for collecting ideas and comments to improve the city quality, a community coordinator
	2	creates communities, provides space for self-development	Motivational and support programmes for citizens, education to raise interest in a quality city environment
	3	shares (collaborative economy)	Concepts of sharing (workplaces, means of transport, etc.)
	4	cultivates the public space	A comprehensible territorial plan and its visualization, territorial research studies and public space regulatory plans, public space categorization. A coordinating role of the city architect or a similar position within the city.
<b>C: Infrastructure</b>	1	Covering the whole city	Technology and citywide regulation, data collection, management and use of smart scenarios

<sup>1</sup> It does not have to be a separate strategic document.

	2	Multipurpose solution	One investment/technology to cover multiple purposes, synergy between technologies
	3	Integrated solution	One central administration (e.g. data centre and integration platform)
	4	An open solution	City data in open datasets or in integrated applications for citizens, communities, service organizations and businesses
<b>D: The resulting quality of life and attractiveness of the city</b>	1	Quality of life: a connected, open and cooperative city	Variety of services and space for business
	2	Quality of life: a healthy, clean, cultivated city pleasant to live in	Environmental impact on the citizen
	3	Quality of life: an economically interesting and attractive city	Financial impact on the citizen
	4	A city with an excellent reputation	Media image of SC programmes of the city

**A. Organisation**

**A. 1 Political commitment, vision of the city**

The good prospects of developing a smart city are based on a political decision and active participation of citizens and public and private entities. A decision of the city’s management, which is formalized in a vision, can express qualitatively or numerically the goals that the city wants to achieve by a certain year (for example, "The share of renewable energy in final energy consumption will increase to 27% by 2030"). The vision should respond to global challenges such as climate change, digital technology or urbanization. Political commitment is not a strategic plan. It is its brief summary expressed qualitatively or in numbers, which may be part of a coalition agreement or an open declaration of the city, which the leaders endorse. The Strategic Plan then develops each of the objectives into sub-strategies or action plans, see Chapter 4.

**A. 2 Organization and allocation of responsibilities**

The decision of the city management entrusts an employee (in smaller municipalities) or a department of the municipal authority to perform the Smart City agenda. The department has the mandate to manage the preparation of the strategy and the action plan, to convene meetings of the various departments of the municipal authority and to decide on disagreements. It has the authority to set up a team of experts from the city's internal staff and add external experts from local and other commercial companies, universities, research, civic associations and other relevant organizations. Its aim is to fulfil the formulated vision in the individual agendas of the city by the set date, therefore, it is in close contact with the political leadership of the city, with which it consults the progress of work at specified time intervals. The responsibility for achieving the goals of the formulated vision is shared with the heads of the individual departments.

As a rule, the strategy is prepared by a project team composed of experts and supervised by a steering committee that includes the city's political leaders and continuously monitors its work and gives it a political mandate. The size of such team is not predetermined<sup>2</sup>.

**A. 3 Strategy and Action Plan**

The Smart Cities concept as a goal is formalized in the city's strategic documents. The cities, municipalities or regions very often already have various development documents of a strategic nature, be it land-use documentation or a variety of sectoral strategies or specialized studies such as a transport strategy or sub-territorial development strategies.

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<sup>2</sup> A functional commission should hold (internally or externally) the following competencies: (a) project owner, (b) project manager, (c) IT specialist, (d) data analyst, (e) open data supervisor, (f) city planner / city architect, (g) public relations officer.

When creating the Smart Cities concept, it is useful to develop a separate strategic document<sup>3</sup> for Smart City, which translates the city's plans and intentions into the goals and structure of the Smart Cities concept as outlined in the previous chapters. Such document should take the insights, plans and intentions from the existing documents and fill any gaps where plans and intentions have not yet been defined.

The concrete steps, their timeframe and responsibilities are elaborated in the Action Plan which is part of the strategic document and the details of which are discussed in Chapter 4 below.

#### **A. 4 Cooperation and long-term partners**

It is desirable that the creation of an intelligent city involves external partners who bring knowledge and experience (research, universities, commercial companies), money (commercial companies) or the needs of users (civic associations). They participate in drawing up the strategy itself (e.g. through narrow-focus working groups) or in the implementation or promotion of the city's programmes. If an external company is commissioned to draw up the strategy, its role is professional, consulting. The external expert does not assume the managerial and political responsibility for developing the strategy.

#### **B. Community**

##### **B. 1 activates and connects**

The city supports civic initiatives and public-private cooperation in diverse Smart City areas. In doing so, it is necessary to reckon with clashes of cultures (e.g. entrepreneurial, bureaucratic, political or non-governmental organisations culture) and to focus on mutual understanding in implementing common goals. Indeed, cultural barriers between cooperating people and organisations may be a more serious obstacle to the implementation of a Smart City than a lack of financial resources. A city may have a community coordinator/mediator to work with the community in general, not only for SC.

##### **B. 2 creates communities and provides space for self-development**

An intelligent city supports the involvement of individuals and the business community in public life by creating and supporting communities (professional, interest-oriented, etc.). The purpose is to develop a sense of belonging of individuals and entrepreneurs to the city as a whole, to fellow citizens and their interests and goals. That involvement is preceded by support for education encouraging the interest in a quality environment in the city.

##### **B. 3 shares (collaborative economy)**

The city supports or directly creates any forms of sharing to make it possible for citizens to meet their needs at an affordable price, while facilitating efficient and sustainable use of property wherever it makes practical sense and is acceptable in terms of culture and customs. In order to improve the environment and reduce pressure on the transport infrastructure, the city supports the collaborative economy, e.g. not owning vehicles by introducing car-sharing or bike-sharing; it supports the establishment of low-rent offices for distance working, which reduces the need to travel (co-working), and creative and cultural centres.

##### **B. 4 cultivates the public space**

Social interaction, i.e. the daily contact of people (and companies) among themselves - is an important parameter of the quality of life of man and the city. The smart city therefore supports it by investing in a quality public space with diverse functions. It is useful to evaluate and, if necessary, adjust the space for the needed functions - such as motorized and non-motorized transport, services for citizens, leisure activities, etc. Quality public space becomes attractive for citizens and attracts entrepreneurs to invest not only in their own business, but also in the surrounding public property. A meaningful overall and strategic demarcation of the public space is defined in the land use plan on the basis of more detailed documents (territorial research studies and master plans), and even more detailed documentation (regulatory plans and modification projects) is created for specific forms. The creation of public space involves the citizens, and to that end, the options offered by modern information technologies can be used. The coordinator of modifications is the city architect if such function exists in the municipality.

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<sup>3</sup> However, it is not absolutely necessary to create a specific strategic document for the implementation of the Smart City concept if the standard development strategy of the given territory is of high quality.



The public space is located in the so-called urban parterre (the “ground floor of the city”), with urban greenery and water elements forming an essential part of it - see Chapter 3.4.

## **C. Infrastructure**

The Smart Cities infrastructure consists of urban mobility, the environment, energy, security, e-government, through applications and services, all embedded in ICT and the green infrastructure of the city - discussed in more detail in Chapter 3.4. The following components apply to all of the above infrastructure elements:

### **C. 1 A blanket solution**

The implementation and development of the urban infrastructure needs to be approached comprehensively throughout the territory - to determine the basic concept at the top management level and to adapt its concrete implementation to the needs and requirements of specific locations and groups of people. It is necessary to avoid partial, mutually incompatible solutions promoted by partial interests.

### **C. 2 A multipurpose solution**

A smart city is smart, among other things, because it is able to cover several of its needs with one investment in one system. Multipurpose promotes systemic synergy and market diversification, i.e. the need for more commercial entities and professions to cooperate. The organizer of such cooperation is the city. The city is thus the creator of an open market and a driving force for innovation. An example of a multi-purpose solution can be an integration platform or a 'smart' public lighting infrastructure serving both surveillance systems, high-speed internet and other functions. Thus, apart from new solutions, a smart city integrates the ones already in use in its single SC concept.

### **C. 3 An integrated solution**

The interconnectedness of the individual functions of Smart Cities and the technologies used to achieve it, together with the need for a unified conceptual approach, leads to the need for integrated management. Its specific form is determined by the size of the city and the local conditions. For example, a Smart City Information Centre can be established in larger cities to manage and connect the diverse systems and to publish either raw or pre-processed data from the systems within a single integration platform (so-called open data). The Centre is also the city's expert workplace that can supervise the installed pilot innovations in an area designated by the city through a so-called urban lab (see Chapter 5.2). But such workplaces must be part of the overall team caring for the city's development and environment, and their work must have a real impact on the city's change.

### **C. 4 An open solution**

So-called open systems can function as a measure against the so-called "vendor lock-in" wherein the city as a customer is dependent on a single supplier. The open systems define, for example, technological standards or unified communication protocols by which the various devices communicate to the Centre or local exchange. That way, for example, the system from one supplier may be connected to devices from other suppliers. In addition to open systems, another important concept are open data - see Annex 3 for more. The open systems should also be preferred when developing conceptual and strategic documents such as territorial analyses and geodetic data.

## **D The resulting form of a smart city**

### **D. 1 Quality of life: a connected, open and cooperative city**

The Smart Cities concept focuses on improving the quality of life in cities and on managing the city more effectively. The condition for any improvement is the continuous recording of needs and achieved results, which will reveal both the current and the long-term trend of development. Working with data, their continuous monitoring and evaluation are an important indicator that the city is heading towards the Smart Cities concept. At the same time it is necessary to keep in mind that **information is only such data that reduce uncertainty in decision-making**. At the same time, these data should be mined from the big data of the city and interpreted objectively, in a broad context and dynamically. Only that way the city can be prevented from **having extensive data available**, from which it is very difficult to obtain the necessary information. The resulting form must be the outcome of activities based on identified needs of citizens or deficiencies or, on the contrary, the outcome of strengthening the unique elements of the city that are important to citizens. The resulting form is thus created by cooperating with the citizens.

## **D.2 Quality of life: a city pleasant to live in**

This aspect concerns the specific impacts of the smart city concept on the quality of public space and of the individual elements of the environment. First of all, an environment that is pleasant to live in has a minimum of emissions from transport and other sources, minimum noise, ample space for non-motorized transport, ample urban greenery, availability of diverse services, is of high quality, cultivated, useful and inspiring.

## **D.3 Quality of life: an economically interesting city**

A city that is pleasant to live in has attractive housing. It keeps existing residents and attracts new ones. By doing so, the city obtains resources from centralized sources. Such city is also attractive for business and investment, thereby generating additional funding for its development. **That is the basic, objectively given economic logic and driving force of the Smart Cities concept.** So Smart Cities is not a fad of political marketing, but a means of economic growth of the city through the quality of life in the city.

## **D.4 A city with an excellent reputation**

The city as a pleasant place to live and an attractive place to do business must make itself known. This creates a "brand" that promotes the city as a "good address". The city continuously monitors how it is perceived by its surroundings and actively influences that perception by appropriately chosen promotion.

### 3 Smart Cities infrastructure

The methodology addresses the following core areas of the Smart Cities technology infrastructure:

- mobility;
- energy and services;
- information and communications technologies.

These technological pillars are embedded in the green infrastructure of the city. Together they help to implement the four basic levels of Smart Cities described above.

#### 3.1 Urban mobility structure

To implement clean urban mobility means to address and promote a balance between all elements of urban mobility (motorised and non- motorised, individual, mass, freight, cycling and walking...) including the requirement for effective traffic management taking into account the needs of IRS units, emergency and breakdown services (network operators and energy suppliers) and city services (public transport).

There is also an area of public services - a subset of motorised mobility, that should partly overlap with the freight and individual transport subsets. It includes city services (public transport, waste collection, etc.), network operators and suppliers (electricity, gas, water).

Urban mobility also includes the means of transport of IRS:

- Fire Rescue Service of the Czech Republic - mainly freight (fire tanker trucks);
- Police - mostly passenger cars;
- Emergency medical services - mostly passenger cars (ambulances).

The tool is the regulation of urban mobility while providing a user-friendly alternative - such as high-quality public transport, support for low-emission vehicles, etc.

To that end, it is possible to use tools of modern information technologies, including the Internet of Things (IoT) - such as transport telematics, support for efficient vehicle management in public transport, etc. At the same time, the possibilities of developing the concept of Mobility as a Service (MaaS) can be used.

#### Related information:

- This issue is further elaborated in Annex 1.

#### 3.2 Energy, resources and services

Smart energy and services include in particular:

- intelligent management of energy consumption, including the energy management of city buildings and the promotion of energy-saving solutions for them;
- the use of renewable energy sources or cogeneration and their secure integration into the city's energy network;
- use of smart grid elements in the city's or region's power grid, including smart micro-networks for different purposes;
- intelligent management of urban services geared towards efficient use of energy and natural resources - above all energy efficient and environmentally-friendly public lighting, efficient waste management and efficient water management.

#### Related information:

- This issue is further elaborated in Annex 2.

### 3.3 Information and communications technologies

Information and communications technologies (ICT) support both the infrastructure side of city life and the city management process itself. In addition to the already mentioned use of ICT in mobility, this includes:

- systems of communication between the city government and citizens and diverse information applications for citizens and visitors;
- systems of intelligent management of public lighting and other urban services, including, for example, energy and water management;
- monitoring and security systems for the protection of property and citizens in the city, including fire alarms and environmental monitoring;
- monitoring and diagnostic systems for early detection of failures in the city infrastructure;
- intelligent payment systems in urban services (e.g. public transport or parking);
- information systems for the protection and monitoring of seriously ill and disabled citizens, etc.
- coordination of information about city buildings and land for their shared alternative use

#### Related information:

- This issue is further elaborated in Annex 3.

### 3.4 Green infrastructure of Smart Cities

The city's green infrastructure is an essential part of the city's parterre. It is made up of **permeable surfaces, urban greenery and water features including retention and accumulation areas**. This green infrastructure complements the "grey infrastructure" of technologies and buildings and forms its framework necessary for the life of people in the city. The tools for implementing the green infrastructure in the Smart Cities concept are territorial research studies, master plans, land use plans, regulatory plans and specific projects. The coordinator is the city architect if such function exists in the municipality.

The benefits of **urban greenery** for the residents are sometimes referred to as so-called ecosystem services of vegetation. Those benefits can be divided into several types:

#### (a) Urban benefit

A prerequisite for healthy living in a city is the necessary area of public greenery and parks and other natural elements in relation to the population size. Experience and general rules exist on how to assign the required area of urban vegetation to the population and function of the territory.

#### (b) Architectural benefit

An important prerequisite for a pleasant life in the city as the result of Smart Cities is also the overall aesthetic impression of the urban environment. The landscaping of public spaces, including the surroundings of public and private buildings, contributes significantly to that.

#### (c) Climate benefit

This covers the cooling of towns as thermal islands in hot weather. In photosynthesis, green matter consumes not only solar radiation but also a considerable amount of heat. For example, a normally grown tree will produce about 30 to 40 air conditioning units daily (outside the dormancy period).

**Water features** - springs, streams, rivers, ponds, reservoirs, fountains, drinking fountains, artificial canals, rainwater retention and accumulation areas, etc.

Water features play an irreplaceable role in both holding rainwater and in evaporating water, same as urban greenery they cool the city as a thermal island. Last but not least, they provide, like urban greenery, the architectural benefit, and create a pleasurable place to rest.

## 4 Smart City strategic document, its content and structure

### 4.1 The objective and structure of the strategic document

It is not absolutely necessary to create a specific strategic document for the implementation of the Smart City concept if the standard development strategy of the given territory is of high quality. If the local government decides to develop a separate Smart City strategy<sup>4</sup>, then such document should be coordinated with the main development strategy (to avoid duplication of information and fragmentation of projects and their verification) and perform the following basic functions:

#### (a) Brief presentation of the city and the Smart Cities concept

This section defines the city, municipality or region covered by the document. It also provides a justification for why the city has chosen the Smart City path.

#### (b) Description and evaluation of the baseline situation

Here, the strategic document describes the baseline situation of a given city or region, focusing in particular on the condition and current problems of the city and of the various areas of urban life.

The initial situation is further evaluated using the commonly used tools and models of strategic management. These can be, for example, the analysis of stakeholders affected by the Smart Cities concept who can support it if an appropriate approach is taken (see chapter 4.2 below) or the final SWOT analysis, i.e. an analysis of strengths, weaknesses, opportunities and threats. Such assessment serves as the basis for justifying why the city decided to take the Smart City path.

#### (c) Formulation of strategic goals

In this section, the conclusions of the analysis are translated into specific goals that are to be achieved in the period covered by the strategy (usually medium term). There are also indicators for assessing the level of achievement of those objectives.

#### (d) Analysis of upcoming development projects

This part analyses and evaluates the projects already under preparation from the point of view of the set goals and structure of Smart Cities, and their contribution to the objectives of that concept.

#### (e) Proposal of new development projects

Based on the analysis of already implemented or proposed development projects, gaps are identified for new projects that are proposed in this section as regards their objectives, expected benefits, potential risks and timeframe.

#### (f) Financial resources for implementing the development projects

This section identifies the possible financial resources for implementing the development projects, both subsidies and other sources, such as bank loans or private capital under public-private partnerships (PPPs) or the EPC concept.

#### (g) Implementation plan (also action plan)

An implementation plan or action plan means a schedule for further action, including the organisational arrangements and definition of responsibilities for each of the actions and activities.

Therefore, the Smart Cities strategy

- sets the direction and goal of Smart Cities development based on the current situation and needs of the city or region;
- gives a system and structure to the existing and forthcoming development projects;
- discovers and fills the "blanks" among development projects where they are needed from the city's perspective;

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<sup>4</sup> It is necessary to ensure coherence with other strategic documents of the city (e.g. SUMP, SECAP etc.)

- determines relationships between the projects in terms of purpose, continuity and resource requirements;
- defines the financial resources needed to implement the projects;
- determines who, when and how will implement this strategy and who coordinates and verifies it.

#### **(h) Monitoring and evaluation of the strategy and the action plan**

The strategy and the implementation must be evaluated in connection with new documents that may emerge. This step may lead to possible adjustments of the strategy.

It is necessary to win political support for the strategic document in order for the implementation of the Smart Cities concept to succeed. Naturally, a certain level of culture - political, organizational and human - is necessary so that the implementation of Smart Cities is not limited to one term of office.

#### **Related information:**

- This issue is elaborated in Annex 5.

## **4.2 Stakeholders in developing and implementing the strategy**

The following stakeholders should be involved in creating and implementing the Smart Cities strategy:

#### **(a) Policy and strategy level:**

- Public administration at national, regional or city level;
- Regulatory authorities (e.g. the Energy Regulatory Office);
- Non-profit organisations;
- External experts working on the strategy (consultants, expert groups, research organizations, universities, etc.)
- City architect, if such function exists, as a supervisor of the city's overall strategy, development of its environment and care for it

#### **(b) Business level**

- Developers and private investors;
- Technology suppliers;
- Commercial service suppliers;
- Financial institutions.

#### **(c) Operator level: public service providers**

- Network operators (electricity, telecommunications, water, gas, etc.);
- Energy suppliers (electricity, gas, heat);
- Operators of transport and other urban services;
- Components of the Integrated Rescue System (Police of the Czech Republic, providers of emergency medical services, Fire Rescue Service of the Czech Republic).

#### **(d) User level: citizens, institutions**

- Owners (e.g. of real estate);
- Other citizens concerned.

This list is not exhaustive - it is up to the strategy authors how specifically they will define the stakeholders and how they will work with them. When creating the strategies, it is advisable to be inspired by already defined models, an example is a so-called stakeholder map which divides them by power (influence) and interest, see the following figure:

**When putting the Smart City concept into action, it is necessary to inform citizens, interest groups and other entities and, as the influence of the entities increases, to proceed gradually to mutual communication and coordination, up to the level of management.**

The stakeholder management in everyday practice should be governed by some time- and experience-tested principles:

- **Act, not just discuss.** Discussions, although informed, are a waste of time if their impact does not go beyond the meeting room.
- **Listen, not just talk.** People who like to listen to themselves are the downfall of every meeting.
- **Be creative, engaging.**
- **Understand things in a broad context.** The interests of people, which the strategy meets or threatens, may seemingly not be related to it.
- **Talk to people in their language.** What is a clear and comprehensible term for one can have several completely different meanings for another.
- **Create relationships, search for allies.** An ally may be in the ranks of seeming enemies if he has the same interests in the matter at hand.
- **Do not underestimate human emotions.** According to psychologists, even so-called rational decisions are adopted in more than fifty percent based on our emotions. It is therefore necessary to name them and work with them.
- **Always do for others a little more than necessary.** In fact, anything beyond your obligation can be a good investment in future relationships.
- **Stay in touch with the people involved.** The above stakeholder map will help you choose the most important ones.
- **Be honest with others and yourself.** A lie or deliberate misrepresentation of facts can bring short-term benefits, but in the long run leads to irreparable damage.

### 4.3 Evaluating the success of the Smart Cities strategy

In the most general sense, it can be stated that **the final indicator of successful implementation of the Smart Cities concept are satisfied citizens and users of the city, including companies.**

In assessing the Smart Cities strategy using various economic, technical and other indicators, it is necessary to clarify the purpose of the evaluation:

- If the main goal is to seek international comparison, then internationally recognized methodologies and indicators need to be applied. For example, ISO 37120: 2014 Sustainable Development of Communities - Indicators for City Services and Quality of Life, containing about 100 different indicators of quality of life in cities, is useful. Other benchmarks may be used if clearly defined.
- Where the main goal is primarily to meet the need for monitoring and evaluation of results, it is appropriate to build the assessment on the actual situation and priorities in solving problems and to determine appropriate indicators for it, at **the extent practically manageable by the particular city, municipality or region.** Many domestic and foreign documents and experience (such as the European project CITYkeys) can be a useful guide.

The usual assessment method is the use of statistical indicators such as energy consumption per capita. Their advantage is that they are easy to understand and observable over a long term. Their problems include that they usually do not distinguish between the effects of Smart Cities and other factors affecting developments in the area. They compare "what is" with "what was" and not "what would be if there wasn't Smart Cities". That needs to be taken into account when interpreting the results of similar indicators. Above all, it is necessary to ensure **a clear definition of indicators and a uniform way of**

**determining them** - for example, the indicator "share of low-emission transport in the city" may have a number of different interpretations and results<sup>5</sup>.

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<sup>5</sup> The indicator system is available on the website [www.smartcities.mmr.cz](http://www.smartcities.mmr.cz).



## 5 Basic types of projects for implementing modern technologies in the Smart Cities concept

Projects for implementing modern technologies within the Smart Cities concept can be diverse. Their form then determines the sources of funding, including any public funding programmes. Here, the following two basic types of projects must be distinguished:

### 5.1 Investment projects

An investment project is the acquisition and operation of facilities such as transport vehicles, information technologies or other assets already offered by the supply market. They can be acquired from the contracting authority's own resources, using bank instruments or a subsidy from European or national sources intended to co-finance investments<sup>6</sup>.

The contracting authority, which implements such a project, acquires all assets into its ownership while respecting the public procurement rules. The contracting authority is then entitled to demand absolute reliability of the supplied solutions from the suppliers.

The acquisition of these assets should, by nature, be directed towards the highest possible standardization and practice-tested technologies as to prevent vendor lock-in (see point C. 4 above) and to reduce, in tendering procedures, the risk of legal obstruction by unsuccessful bidders.

### 5.2 Development projects

On the other hand, in a development project (also called "demonstration" or "innovative"), the city works as a "living lab" for modern technologies deployed in the project. It is assumed that most of the cost of such a project is covered by manufacturers or dedicated research, development and innovation programmes<sup>7</sup>.

As a rule, the city or other organization that uses the technology only pays the costs directly related to its operation. Manufacturers are getting live operation data for their invested money to test their technical solutions. Such data are necessary for the commercialization of the tested technologies.

Thus, this type of project provides greater freedom in terms of the nature and non-standardization of the technologies used. On the other hand, with regard to the testing character of the operation, their absolute reliability and 100% availability cannot be expected and required.

It is desirable for the development/innovation project to enter routine operation after its successful implementation. However, that is not predetermined. A distinction must therefore be made between the two types of project in order to avoid misunderstandings arising from different expectations on the part of the supplier and the user.

#### Related information:

- Subsidy options for cities and municipalities under Smart Cities are listed in the Summary of Current Calls in Key Areas of Smart Cities, which is updated quarterly and available for download at [www.smartcities.mmr.cz](http://www.smartcities.mmr.cz).
- The private financing tools for Smart Cities projects are elaborated in the related Smart City Project Financing Methodology (available at [www.smartcities.mmr.cz](http://www.smartcities.mmr.cz))

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<sup>6</sup> In addition to investment projects, technology can be acquired as part of non-investment costs, i.e. in the form of services (rent, operation, maintenance).

<sup>7</sup> There is also the possibility of a so-called pilot project without the contractor's financial contribution.

## 6 Local Agenda 21 (LA21) and its relationship to the Smart Cities concept

### 6.1 Basic information about LA21, institutional arrangement

Local Agenda 21 is part of an international programme, as set out in UN Agenda 21 (1992, Chapter 28: Local Authority initiatives to support Agenda 21). In the Czech Republic, based on general recommendations for public administration at local level (document Agenda 21), a system of a comprehensive approach to sustainable development at local level called Local Agenda 21 (LA21) was developed in cooperation with national, regional and local representatives. The concept is continually updated, currently it is set to meet the 2030 Agenda, and can be used to meet SDG 11 “Sustainable cities and communities”.

The national government has set up methodological, evaluation and financial support for implementers... The qualitative and quantitative development of the Local Agenda 21 (i.e. an increase of implementers from among municipalities/cities, micro-regions, regions and LAGs) is specific objective 20.3 of the Strategic Framework for Sustainable Development Czech Republic 2030, Government Resolution No 292/2017. The content of the LA 21 concept is the responsibility of the Ministry of the Environment. At the same time, it is referred to as the method of public administration quality of the Ministry of the Interior (while maintaining the responsibility of the MoE - there is no change or joint responsibility).

### 6.2 Setting of the LA21 Concept in the Czech Republic, evaluation

The setting of the Local Agenda 21 evaluation, i.e. of local sustainable development, also provides methodological guidance. It is of two types: criteria and audits.

**Criteria** focus on important cross-cutting processes that need to be applied in all thematic areas of sustainable development (specific requirements are given in brackets).

- institutional settings (Declaration, policy, coordinator, Commission, an official authority for sustainable development);
- participation (cooperation with the public);
- promotion and presentation of LA21 and sustainable development, sharing good practice;
- cooperation of public administration with the non-profit and business sectors (in various areas of sustainable development);
- sustainable development training for the authority (including coordinator- coordinator profile), for self-governments and public awareness;
- strategic management and planning (improvement plan and its evaluation, sustainable development strategy, strategic plan of the community development, partial concepts or plans, quality methods);
- financial support (linking the budget to LA21 activities, obtaining external resources, financial support for LA21 implementers from the region).

The criteria are set for 5 types of local and regional public administration (villages up to 2000 inhabitants, municipalities, separate municipal districts, micro-regions, regions) and LAGs. Further division is by the degree of advancement (ascending): categories D, C, B, A.

**Audits** mean internal self-assessment according to a given methodology. In categories B and A, audits must be carried out in all areas of sustainable development (see below) and commented on by experts. In category C, audits can be carried out gradually and in any number, the completeness is checked by an expert (not commented on). According to the number of expert-checked audits (3, 7, 10), category C is marked with 1 - 3 stars.

<b>Thematic areas of LA21</b>
1. a – Governance
2. b - Territorial development
3. Quality environment
4. Sustainable consumption and production
5. Transport and mobility
6. Public health
7. Local economy and business
8. Education and upbringing
9. Culture and local traditions
10. Social environment in the community
11. Global responsibility

### **6.3 Relationship of LA21 to the Smart Cities concept**

Both Smart Cities and LA21 have a similar content and goal but a different history. The former emerged as a European industrial initiative from a modern technology environment, the latter as a UN activity. **They both meet in the city strategy and its implementation in everyday practice.**

When applying the Smart Cities concept and LA21, it is always necessary to avoid duplication from the start, especially in the organizational structure. So, if the city is already implementing LA21 as part of its strategy, there is no need to create a parallel structure and strategy for Smart Cities. If, while implementing LA21, the city also fulfils the elements and approaches recommended by this methodology, it can endorse the Smart Cities concept at its discretion and preference.

## 7 Conclusion

Smart Cities is one of the modern-day tools of strategic city management helping to improve the quality of life in the city with the use of modern technologies, and consequently to achieve the city's economic and social goals.

Thus, modern technology is not an end in itself, it is a means of making a city a pleasant place to live, because only such a city can prosper economically. The city is made a pleasant place to live, at the same extent, by its green infrastructure.

In order for such prosperity to be sustainable, it must also be sustainable environmentally. In achieving that, a simple managerial balance of powers and responsibilities must be respected.

The concept of Smart Cities in the spirit of this methodology can be applied in a multi-million metropolis as well as in a town with several thousand inhabitants. The Smart Cities concept is not confined to the city's administrative boundaries - a smart city gradually grows into a smart region.

The implementation of Smart Cities is the responsibility of the city or municipal management. We believe this methodology provides useful guidance.

## 8 Explanatory notes, abbreviations and units

- EPC** Energy Performance Contracting, a method of projects with guaranteed savings, investments are repaid from future energy savings
- ICT** Information and communications technologies
- LA21** Local Agenda 21
- PPP** public private partnership
- SC** Smart Cities
- SUMP** Sustainable urban mobility plan
- SWOT** strengths, weaknesses, opportunities and threats

## 9 List of information sources

Methodology of the Smart Cities Concept, MoRD CR, Prague, 2015.

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