

The European Commission's
**INTELLIGENT CITIES
CHALLENGE**

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Vratsa: Intelligent City Transformation Overview

ICC Final Deliverable



Executive summary

During the ICC implementation the Municipality of Vratsa could identify priority topics and related activities that can transform the city into smarter, cleaner, greener, more developed and attractive to the citizens, tourists and city guests.

Until that moment the Municipality of Vratsa has implemented a few projects in this regard, but the ambitions are for further and continuous digital transformation.

According to deeper analyses of the strengths and weaknesses within the city of Vratsa it is visible that there are many opportunities and sufficient level for implementation of smart solutions and digitalisation in most of the processes in the field of green economy and sustainable tourism. Some of the weaknesses are related to the citizens understanding and readiness to use and accept the new digital innovations in the urban area. Another very common obstacle is the lack of financing and the relatively small municipal budget. However, the vision of the city is for more digital solutions in the urban area that will make it more accessible and friendly not only to the local citizens, but to the tourists as well in combination with better quality of the provided public services.

The city of Vratsa together with its settlements are now included in **online platform with interactive map** for the places for separate waste collection which was one of the greatest ambitions of the local authorities. Further activities that can be done include the development of an integrated smart management system that requires bigger investments.

For the next 3 years Vratsa ambitions are related to the further digitalization of most of the services that the Municipality of Vratsa provides as well as implementation of smart solutions in the field of tourism that will ensure better experience in the tourist sites as well as cleaner and sustainable environmental protection through the development of an integrated waste management system.

Mayor Foreword

On local level some of the foundations of circular economy and smart tourism have been laid through the provision of underground waste bins as well as waste bins for separate waste collection; the development of composting installation and the modernization of the public transport in the city of Vratsa.

Vratsa is the first regional city in Northwestern Bulgaria that has ensured the installation of 20 underground containers for household waste, with the capacity of each container being three times larger, compared to the currently used containers for household waste.

Vratsa is also the first city in Northwestern Bulgaria that will build underground containers for the separate collection of recyclable waste.

Further action will be made regarding the installation of sensors for monitoring of the amount of waste in the waste bins as well as the development of integrated system for waste management in the municipality of Vratsa.

In relation to the established economic and technical inefficiency of the heating installation in a kindergarten in the Municipality of Vratsa, actions were taken to integrate an additional system to produce a hydrogen-oxygen mixture, which would improve the combustion process of the functioning space for two hot water gas boilers. The system is fully automated and allows monitoring of the production process in real time with a productivity of 4 cubic meters/h .

In the field of tourism, the "smart" topic is completely new as the tourist destinations and point of interest still suffer from the COVID-19 pandemic. Efforts were made to bring back tourists, so the focus was not on making tourism smart. Some of the most significant priorities laid in the Plan for Integrated Development of the Municipality of Vratsa is the renovation of the existing tourist infrastructure. It was discussed with the ICC that there need to be an online platform with all necessary tourist information that will allow easy access and attract more tourists to visit the region of Vratsa.

In relation to the abovementioned ICC is a great opportunity for exchange of good practices and sharing experience with more developed cities and highly qualified lead experts. The challenge also helped us to involve different stakeholders and to find the strengths and weaknesses of the defined solutions.

Section

1

September 2020 to January
2021

Vratsa: Preparation and assessment

ICC transformation



Introduction

For the last few years, the Municipality of Vratsa has invested funds and developed many projects with the main purpose to create the so-called "smart city". At the end of 2019, in the Municipality started the construction of new digital hub that provides free of charge large a number of services in the field of information technology, including - training, certification, software development, work with software platforms and digital project management. Furthermore, Vratsa is the first city in Bulgaria where the most modern system for video surveillance and control was implemented.

The National Statistical Institute announced that for the 2017 Vratsa is the district with the highest growth of the Gross Domestic Product (GDP). The good performance of many companies in the region of Vratsa provides employment and a significant contribution to the local economy.

For the city management it is important to continue the implementation of smart and digital solutions into the urban area which will facilitate the local citizens and city guests



Section 2: City needs

State of the city overview

THE STATE OF VRATSA TODAY

- Provided more working spaces through the attraction of foreign investments;
- Sufficient experience in the field of preparation, implementation and reporting of national and international projects;
- Signed partnership agreement with the Municipality of Craiova, Romania for the next Bulgaria-Romania Cross border cooperation Programme;
- Integration of an additional system to produce a hydrogen-oxygen mixture, which would improve the combustion process of the functioning space for two hot water gas boilers in a kindergarten;
- Submitted and approved Plan for Integrated Urban Development of the Municipality of Vratsa for 2021-2027 period;

Key insights from city performance analysis

Higher performance observed

- 1 Implemented energy efficiency measures in public buildings
- 2 Developed transnational partnerships
- 3 Provided bicycles as alternative means of public transport
- 4 Renovated open urban spaces
- 5 Organized public events that attracted many tourists

Lower performance observed

- 1 Limited financial resources of the Municipality
- 2 Unstable political situation on national level
- 3 Lack of tourists due to the pandemic
- 4 Needs for implementation of more energy efficiency measures
- 5 Low level of innovation activities and not enough ICT skills of the employees

Section 2: City needs

State of the city overview

The state of Vratsa today with reference to green and circular economy and sustainable tourism

- Good readiness level of the Municipality for the next programming period;
- Laid foundations in the field of smart tourism through the upgrade of an existing platform for tourism in the region of Vratsa;
- Provision of more underground waste bins with bigger capacity for cleaner environment;
- Good relations with representatives from the local ecosystem;
- Further development of the CEMIS platform for green economy needs to be done;
- More underground waste bins have been installed.

Key insights from city performance analysis

Higher performance observed

- 1 Finalization of the project for development of composting installation
- 2 Complete project readiness for digitization of the Regional historical museum exhibits
- 3 Most of the planned public and tourism related events have been conducted since it was impossible for the past two years due to the pandemic
- 4 Implementation of project for digitization of 10 popular tourist landmarks in the region of Vratsa
- 5 Participation in a platform for green economy - CEMIS

Lower performance observed

- 1 Economic and gas crisis that change the focus on that problem instead of sustainability and tourism
- 2 The unexpected impact on all sectors of the COVID-19 pandemic that caused lack of resources
- 3 Needs for the development of web platform for tourism
- 4 Needs for more infrastructure investments
- 5 Needs for changing people's attitude and behavior to the environment

City Ecosystem

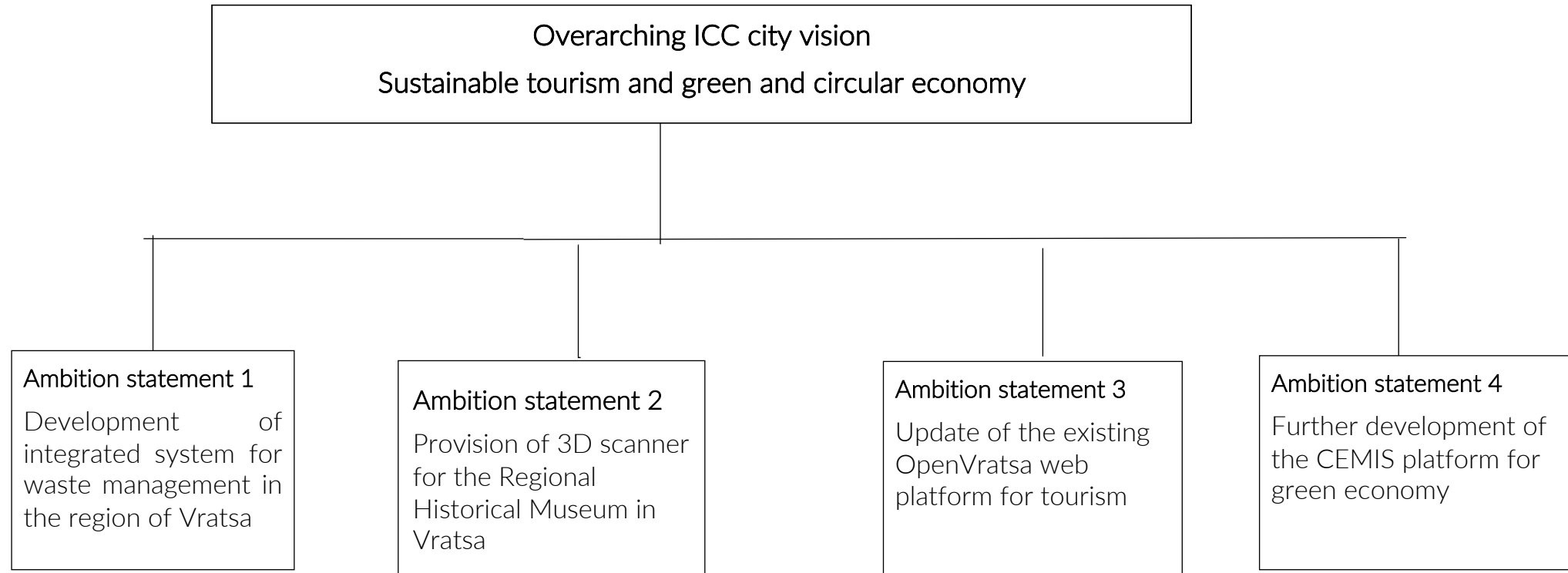
There is a good presence of different types of public and business organizations, NGOs and associations in the city of Vratsa, which have been identified as stakeholders in the ICC such as Youth center-Vratsa, Municipal enterprise BKS, Municipal enterprise "Sport and tourism", Ecoproject Ltd., Chamber of commerce and industry-Vratsa, Agency for regional economic development – Vratsa, "Trolleybus transport" Ltd., "Magisterium" Ltd. Their work is focused on social activities related to environment, circular economy, waste management, tourism and tourist destinations, cultural and historical heritage, IT, youths, disadvantaged people, education, promotion of entrepreneurship etc. The Municipality of Vratsa works in close relation with these organizations and often consults their opinion on key and socially important topics.

For the purposes of the project, an online meeting with representatives from the city ecosystem was organized on 19.11.2020. Their selection is based on their work and experience in the field of the selected priorities for the city of Vratsa related to green economy and sustainable tourism.

All invited stakeholders took part in the Stakeholder workshops that were organized with the support of the lead experts within ICC. The workshops were conducted in November and December 2020, January 2021 and the first face to face meeting in July.2021. Local NGOs, business organizations and policy makers were very active during the discussions and had very helpful suggestions for the development and the implementation of the defined solutions in the frame of the project.

During the meeting were discussed the KPIs, opportunities for financing and the potential for implementation.

ICC strategy: Vision and ambition statements



City strategy: justification

At the beginning of ICC the Municipality of Vratsa had the intention to only install sensors for measuring the waste level in public waste bins so this will reduce transport costs to small settlements and optimize the work schedules. During the workshops with the stakeholders it was suggested to an integrated waste management system to be developed.

The solution for virtual museum was developed in relation to COVID-19 pandemic and after some further discussions with the thematic tourism expert it was suggested to change the solution with the provision of 3D scanner and printer for producing our own souvenirs that will be prototypes to the objects in the museum.

The solution for digital signage was also changed with the development of tourism web site for the needs of the Municipality of Vratsa which would be more suitable for the city needs.

All these changes in the city priorities show that every idea at the beginning can be developed, changed or even replaced with another if through the implementation it is no more feasible. Thanks to the appropriate proposal, suggestions and opinions of the representatives of the local ecosystem solutions were upgraded and further developed so they can generate more added value.

The three most important things that need to be done for the success of the solutions are as follows:

- Further interactions with the local ecosystem. Their representatives have to be kept with up to date information; they need to know that their opinions are important and will be heard in the decision making process.
- Awareness rising campaigns so all citizens and city guests will be informed about local priorities, changes in the urban area, the importance of green topics, sustainability and environment protection;
- Presentation of functionalities and opportunities of the newly implemented urban digital and smart solutions so all citizens would know how to use and benefit from them.



Vratsa: Ambition and roadmap

ICC Transformation

February 2021 to May 2021

High level implementation roadmap (“10000m plan”)

Activity  Milestone

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
1 Digitization of eco-trails outside the territory of Vratsa Balkan Nature Park	Preparation of a list of eco-trails and their prioritization	Preparation of a list of eco-trails and their prioritization	Meeting between the different stakeholders, who deal with the administration of the paths	Making a decision to proceed with the decision		
2 Development of a tourism web site for the needs of the Municipality of Vratsa	Number of meetings and calls with representatives from the local ecosystem and responsible people that led to changes in the solution			Organization of meetings with the local ecosystem for evaluation of the new idea	Organization of meetings with the Mayor and hosts of OpenVratsa platform	Determination of the responsible people; regularity of the news; updating the information about places for food and accommodation and other technical issues
3 3D scanning and printing of the moveable cultural heritage in RHM-Vratsa	Number of meetings with representatives from the local ecosystem and thematic expert that led to changes in the solution			Communication with thematic tourism expert	Research about 3D scanning and 3 printing	
4 Web platform for green economy	Defining the functionalities and content of the platform, the services that will be included	Defining the technical parameters; integration with other systems	Determination of points for marking the different waste streams; Creating content for citizens; Creating content for companies; Integration of the two parts.	Received invitation for participation in web platform for waste management	Discussion of further functionalities of the web platform	Organization of awareness rising campaigns
5 Waste management system	Defining the functionalities		Budgeting	Public procurement procedures		
Overarching Milestones	 Functionalities	 Budgeting				

Rationale to roadmap

The first project ideas within the roadmap were related to the provision of solutions for issues that the Municipality of Vratsa has in the field of green economy and sustainable tourism. During the workshops and the discussions with stakeholders these solutions were changed or entirely excluded. Some of the representatives in the local ecosystem do not participate in project activities any more due to lack of interest or some other more important issues that they must cope with.

It was important for the Municipality of Vratsa to include different stakeholders in the process of decision making in discussing so different opinions can be shared and heard. Chamber of commerce and industry-Vratsa, Youth center-Vratsa and Municipal enterprise BKS are some of the most valuable stakeholders. Thanks to that we could find out that some solutions like digital signage in the urban area won't be appropriate and effective. Solutions were prioritized.

The digitization of eco routes was also excluded as a solution because another project for digitalization is in the process of implementation by Vrachanski Balkan National Park.

The solution for digital signage was replaced by the existing online platform for tourism called OpenVratsa that just needs to be upgraded with new interface and up-to-date information.

The solution for installation of sensors in the waste bins was upgraded to a whole smart waste management system that would include all aspects about waste collection and waste disposal.

2 Initiative charter: Sustainable tourism (1)

Sustainable tourism	Solution 1: Digitization of eco-trails outside the territory of Vratsa Balkan National Park	Solution 2: Development of an existing online platform for tourism	Solution 3: 3D scanning and printing of moveable cultural heritage (new solution)
Link to vision	Green and digital transition in tourism	Green and digital transition in tourism	Green and digital transition in tourism
Link to ambition statement	Digital solutions for improving the tourist routes in and outside the territory of Vrachanski Balkan Nature Park	Raising awareness about cultural and natural heritage of Vratsa and the region through interactive digital information boards	Digitalization of moveable cultural heritage and production of prototypes and souvenirs
Description	Creating a digital system for eco-trail, but this solution was excluded because Vrachanski Balkan National Park that is responsible for its implementation already implements a project for digitalization.	The solution for the development of an existing online platform consists of the determination of responsible experts who will generate, upload and maintain the existing web site Open Vratsa which will provide up to date tourist information	A project for the digitization of 36000 movable cultural heritage sites has been submitted for evaluation to the FM of EEA but the project was not approved Then the solution was changed to the provision of 3D scanning and printing facilities
Estimated cost and source of funding	City budget EU funds Operational programs	City budget EU funds Operational programs	City budget EU funds Operational programs
Initiative lead	Municipality of Vratsa	Municipality of Vratsa	Municipality of Vratsa
Initiative working team (core team)	Steering Committee: Open Vratsa Chamber of Commerce-Vratsa Vratsa Balkan National Park Regional Inspectorate for Environment and Water - Vratsa Core team: Polina Georgieva, Irena Nikolova from the Municipality of Vratsa Technical experts: Leadvision	Steering Committee: Chamber of Commerce-Vratsa Vratsa Balkan National Park Core team: Polina Georgieva, Irena Nikolova from the Municipality of Vratsa Youth center Youth house Technical experts: Open Vratsa	Steering Committee: Open Vratsa Chamber of Commerce-Vratsa Regional Historical Museum - Vratsa Core team: Polina Georgieva, Irena Nikolova from the Municipality of Vratsa Technical experts: Leadvision
Contributors (stakeholders contributing)	Other companies from the IT sector Vratsa software society Leadvision – Inna Tsvetkova and Hristiyan Geshkov	Other companies from the IT sector Vratsa software society Leadvision – Inna Tsvetkova and Hristiyan Geshkov	Other companies from the IT sector Vratsa software society Leadvision – Inna Tsvetkova and Hristiyan Geshkov (
Ultimate goal and scope of this initiative	The aim of the initiative was to create up-to-date and safe routes, as well as to raise the awareness of local and incoming tourists about the eco-tourism opportunities in the nature park.	Tourists visiting different city sites to learn about other opportunities for tourism in and around the city.	The solution aims to create better experience for visitors and is in relation to the lock down because of the COVID-19 pandemic and the provision of equal access to the cultural heritage

Initiative charter: Sustainable tourism (2)

Sustainable tourism	Solution 1: Digitization of eco-trails outside the territory of Vratsa Balkan National Park	Solution 2: Development of an existing online platform for tourism	Solution 3: 3D scanning and printing of moveable cultural heritage
Major milestones	1. Creating a list of eco paths/trails and other sites inside and outside the park; 2. Prioritizing of paths based on frequency of their use; 3. Organizing meetings between the different stakeholders, who deal with the administration of the paths and clarifying functions and roles; 4. Launching a survey among the tourists; 5. Taking decision about hosting arrangements; 6. Describing the technical characteristics and functionalities; 7. Creating content; 8. Budgeting (incl investment and maintenance costs) and identifying funding sources.	1. Determination of responsible people from both sides – The Municipality of Vratsa who will generate information and Open Vratsa who will upload that information and maintain the website; 2. Determination of timeframe and regularity for the provision of information; 3. Attracting local places for food and accommodation to be part of the platform; 3. Awareness raising campaigns for promotion of the website.	1. The solution for virtual tours of the museum was changed with the provision of 3D scanner and 3D printer so the moveable cultural heritage in RHM-Vratsa can be digitalized and at the same time there will be an opportunity for production of own souvenirs that will be prototypes of the most significant historical objects like the popular gold Treasure of Rogozen; 2. Research about the types and prices of 3D printers and 3D scanners is made; 3. Determination of responsible people for scanning and printing; Funding opportunities
Dependencies	Legal regulations Human and financial resources	Local museums, hotels and tourist points of interest Human and financial resources	Financial recourses for the maintenance Human and financial resources
Key stakeholders	Vratsa Balkan Nature Park authority, local IT sector ecosystem, local citizens and tourists	Hotels, Regional history museum, business organizations, IT sector, local citizens and tourists, tourist agencies	IT sector, Local citizens
Impact and timing	Long term impact - at least 5 years	Long term impact – at least 5 years	Short term impact – at least 2 years
Risks	Breakdown of the system Insufficient resources, problems with coordination between the involved stakeholders	Vandalism and improper use; Lack of financing	Breakdown of the devices
Support needed	Human and financial resources IT support	Human and financial resources IT support	Human and financial resources IT support

2 Initiative charter: Green economy (1)

Green economy	Solution 1: Web platform for green economy	Solution 2: Waste management system
Link to vision	Solution strategy for green economy	Solution strategy for green economy
Link to ambition statement	Digital solutions for citizens - raising the culture and awareness of separate waste collection and prevention, etc.	Digital solutions for citizens - raising the culture and awareness of separate collection, waste prevention, etc.
Description	Development of a web platform for green economy that will raise awareness of citizens about separate waste collection and prevention. In addition, the platform will support the exchange of waste between companies. The platform will be with two different sections, one for the business organizations and one for the citizens.	The solution is related to the construction of a complete system for optimization of waste collection on the territory of Vratsa Municipality, through installation of sensors for measuring the level of filling of waste collection containers, installation of surveillance cameras on waste collection trucks, establishment of a center for monitoring the entire waste collection process.
Estimated cost and source of funding	City budget EU funds Operational programs	City budget EU funds Operational programs
Initiative lead	Municipality of Vratsa Municipal organizational unit "BKS" (the waste collection company)	Municipal organizational unit "BKS" (waste collection) Municipality of Vratsa
Initiative working team (core team)	Steering Committee: Municipal organizational unit "BKS" (waste collection) Waste utilization company Ecopack Regional landfill for waste collection Chamber of Commerce-Vratsa Core team: Polina Georgieva, Irena Statkova from the Municipality of Vratsa Technical experts: Magisterium Ltd.	Steering Committee: Municipal organizational unit "BKS" (waste collection) Waste utilization (EPR) company Ecopack Regional landfill for waste collection Core team: Polina Georgieva, Irena Statkova from the Municipality of Vratsa Technical experts: Magisterium Ltd.
Contributors (stakeholders contributing)	Other companies from the IT sector ecosystem Vratsa software society	Other companies from the IT sector Vratsa software society
Ultimate goal and scope of this initiative	The aim of the decision is to raise awareness and encourage separate waste collection, prevention and sustainable development in the municipality and targets citizens and private sector.	The aim is to optimize the container service system by monitoring the level of occupancy; fair determination of the fees for household waste; optimization of the transport for servicing the waste containers. Better separate waste collection will also result in cleaner, non-flowing containers.

Initiative charter: Green economy (2)

Green economy	Web platform for green economy	Waste management system
Major milestones	1. Defining the functionalities and content of the platform, as well as the services that will be included; 2. Defining the technical parameters; 3. Integrating the platform with other existing systems; 4. Determining points for marking the different waste streams; 5. Creating content for citizens; 6. Creating content for companies; 7. Integration of the two parts; 8. Budgeting	1. Defining the functionalities; 2. Budgeting; 3. Software development
Dependencies	Legal regulations Human and financial resources	Local museums, hotels and tourist points of interest Human and financial resources Introducing a “pay as you throw” system which will make the cameras unnecessary
Key stakeholders	IT sector, local citizens and tourists, neighbor municipalities	IT sector, local citizens and tourists, neighbor municipalities
Impact and timing	Long term impact - at least 5 years	Long term impact – at least 5 years
Risks	Breakdown of the system Lack of funding, because it is a large investment and the municipality does not have enough resources, so we will rely on EU funding. At the same time there are not many programs which are focused on funding such activities - IT solutions and ecology at the same time	Vandalism and improper use; Lack of financing; Breakdown of the system It is possible to use individual waste containers for every household;
Support needed	Human and financial resources IT support	Human and financial resources IT support

3 Key Performance indicators

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
Digitization of eco-trails outside the territory of Vratsa Balkan National Park	<ul style="list-style-type: none"> Number of eco trails defined (within and outside the nature park); 1 survey among the tourists that will inform the prioritization of eco-trails that will be digitized; Nr of meetings between the stakeholders Proof of concept created (defines the technical characteristics and functionalities) Content created Number of digitized eco-trails; Number of tourists using the new service. 	<ul style="list-style-type: none"> Number of tourists who used the new service; Number of trails for diversified tourism experience 	<ul style="list-style-type: none"> Degree of stakeholder participation in the process of planning and implementing the digitisation of eco trails (e.g. number of stakeholders involved in the working groups Average length of stay of tourists increased (%) Contribution of eco-tourism to Vratsa's economy increased (%)
Development of an existing online platform for tourism	<ul style="list-style-type: none"> Number of information boards /digital signage/ - outdoor and indoor; Number of landmarks included in the system; 	<ul style="list-style-type: none"> Nr of tourists interested in the landmarks in the region of Vratsa increased; Number of users of the digital signage increased 	<ul style="list-style-type: none"> Contribution of tourism to Vratsa's economy increased (%) Nr of hotels and other stakeholders involved in meetings
3D scanning and printing of moveable cultural heritage	<ul style="list-style-type: none"> Nr of selected objects to be scanned 	<ul style="list-style-type: none"> Nr of tourist benefitting from remote access to museum objects. 	
Web platform for green economy	<ul style="list-style-type: none"> Number of users of the platform – business organizations and citizens. Content of the platform created Parameters and functionalities of the platform defined 	<ul style="list-style-type: none"> Number of businesses benefitting from waste exchange Nr of citizens benefitting from the services of the platform Nr of campaigns among citizens promoting sustainable waste management. 	<ul style="list-style-type: none"> Improved level of recycling - % of recycled waste;
Waste management system	<ul style="list-style-type: none"> Number of cameras installed; Number of sensors installed. 	<ul style="list-style-type: none"> Container service system improved (%); The efficiency of transport schemes for servicing the waste containers improved (%); 	<ul style="list-style-type: none"> Separate waste collection efficiency increased (%);

Key Performance indicators - Cross cutting indicators

Cross cutting indicators

Number of citizens and business reached

Number of follow-up projects

Lasting citizen engagement

Increased citizen satisfaction

Rationale to KPI approach

Document the decision making process for which KPIs are covered in each of the three KPI types, capturing discussions the city has had on, e.g., availability, actionability, validity, etc.

You can explain here that we defined them last year during the workshop through collective brainstorming,

As a rationale, you can say that the group considered that these KPIs reflect to the biggest extent the nature of the solutions and that the monitoring of these KPIs could guide the municipality during project implementation and follow-up.

4 Governance structure for Roadmap implementation

Mr. Tsvetan Stoychkov who is a Deputy mayor in the field of programs, projects and public procurement is on the top of the governance structure.

The core team consists of:

- Polina Georgieva, Team manager;
- Irena Nikolova, Tourism expert;
- Irena Statkova, Ecology expert;
- Ralitsa Geshovska, Programs and projects expert.

The technical and practical support is provided by Leadvision Ltd.

Representatives of the local ecosystem and very active in decision making are:

- Chamber of commerce and industry-Vratsa
- Youth centre-Vratsa
- Municipal enterprise BKS Ltd.;
- Ecoproject Ltd.
- OpenVratsa.

The European Commission's
**INTELLIGENT CITIES
CHALLENGE**

Section

3+4

Vratsa: Impact

ICC Transformation

February 2021 to May 2021



Impact executive summary

Planning:

- Selection of 3 solutions in the field of sustainable tourism for 1) Digitization of eco-trails outside the territory of Vratsa Balkan National Park; 2) Development of an existing online platform for tourism; 3) 3D scanning and printing of the cultural heritage.
- Selection of 2 solutions in the field of green economy for 1) Web platform for green economy and 2) Integrated waste management system.

What is done?

- Found opportunity for submission of a project under the EEA Grants for digitalization of the movable cultural heritage that unfortunately was not approved.
- Changed solution for digital signage with the improvement of an existing web site for tourism in the region of Vratsa / <https://openvratsa.bg/>.

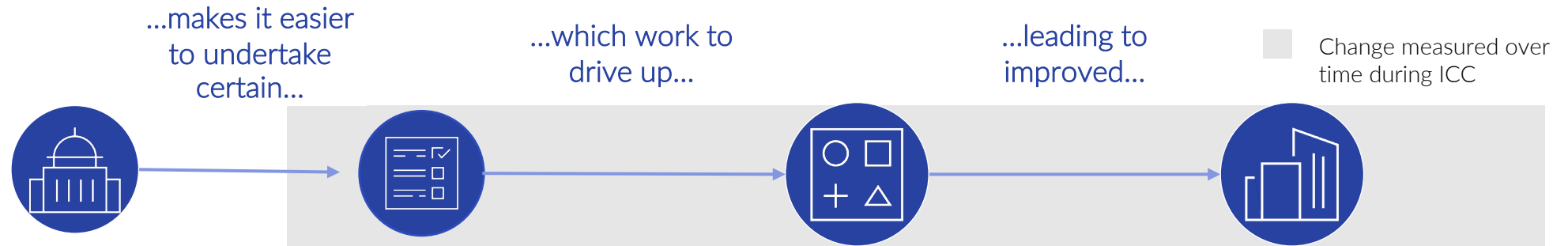
This change was caused by some concerns of the local ecosystem about vandalism and the fact that there is no opportunity for remote access.

- Changed solution for virtual museum with the provision of 3D scanner and 3D printer for cultural heritage objects from the Regional history museum-Vratsa, because the financing can be provided more easily, and the ambitions are to bring tourists on site instead of providing remote access. Furthermore, tourists was to be back on travelling after COVID-19 so there will be a lack of interest on virtual museum. Finally, the museum relies on incomes from the tickets.
- Inclusion of the Municipality of Vratsa into an online platform that provides information about waste collection and waste management in the region <https://www.cemis.bg/en/>

Future ambitions:

- Production of souvenirs and prototypes of the objects from RHM-Vratsa;
- Development of an integrated waste management system for the city of Vratsa and the villages in the region.
- Development of OpenVratsa platform as an official tourist web site with up-to-date information.

There are four types of measurable concepts that come together to drive success in the ICC



Idea	Local enablers – city characteristics	Activities – actions and inputs	Technology maturity – outputs	City performance – outcomes and impacts
Description	Each city has unique strengths and weaknesses that help action happen . These can be stakeholder networks, local capabilities, cultural factors or many more that drive success in ICC projects.	A cities main intervention on the ICC is to take actions . These can be direct (e.g., procuring technology), or indirect , (e.g., forming a working group on a topic). The right actions can lead to the right inputs going in to the ICC (e.g., funding, time)	Cities can drive technological solutions to try and improve city performance. How well these solutions are currently used can be described as their 'maturity' , - considering whether they are available for stakeholder use, what stakeholders think of them, and so on	Success of an intelligent city is ultimately measured by its ability to address city needs . These can be considered an improved quality of citizen life and a better environment for stakeholders
Example	A history of strong collaboration between city and a local university...	...allows the creation of a new e-health pilot project using social housing in the city...	...leads to the launch a new tele-health solution utilising 4G data connections...	...resulting in pre-emptive diagnosis and lower wait times at medical facilities

Assessment of city performance - progress against KPIs

	Where we started	Midway through the challenge	Final results
City performance			
1	Number of developed tourism web platforms for the needs of the Municipality of Vratsa	1	1
2	Number of moveable cultural heritage objects in RHM-Vratsa to be 3D scanned	30 000	0
3	Number of moveable cultural heritage objects in RHM-Vratsa to be 3D printed	30 000	0
4	Number of integrated waste management systems in the city of Vratsa	0	0
5	Number of web platforms for green economy	0	1

We had one web platform that we are in the process of upgrading.

Our intention when we have the 3D scanner is to scan at least 30 000 moveable cultural heritage objects. Th situation is the same with the 3D printer.

We do not have an integrated waste management system for the region of Vratsa in that moment. It is a long-term multicomponent process that requires bigger budget.

For now, the Municipality of Vratsa is part of the CEMIS platform for green economy and our intention is to initiate its upgrading with more functions especially for business.

Assessment of city performance - discussion

The digitalisation of ecotrails in Vrachanski Balkan Nature park was one of the first priorities within ICC. During the implementation of the project a digitalisation of 10 tourist sites has started since it's a project that is managed by the Nature park, not by the Municipality of Vratsa. Eco trails are Natures park responsibility and under their control.

So far, the Municipality of Vratsa has organized discussions with the owners of OpenVratsa web platform and further decisions need to be taken such as the selection of experts in charge; generation and upload of information; regularity; content control; connection with the official web site of the Municipality. The big problem is that the domain is not owned by the Municipality, but it is provided and used for the needs of the local authority. This situation cause some misunderstandings that should be discussed at a higher management level and a decision made whether to use this domain or to create a new one.

A solution for 3D scanning and 3D printing of the moveable cultural heritage objects in RHM-Vratsa has been suggested by the tourism expert attracted from ICC. As this is a relatively new idea, funding opportunities have not been identified yet and need to be explored.

The waste management system is a set of activities that will optimize the entire work process of the responsible municipal enterprise. It requires an integrated approach for sensors installation, development of software and installation of surveillance cameras on the trucks and places with unregulated landfills so the provision of human, financial and technical resources is needed. In this regard the municipal budget will be very insufficient and external funding needs to be provided. The Municipality of Vratsa will rely on structural funds within the new programming period.

The development of a web platform for green economy was among the first solutions dedicated within ICC. Soon after the project started the Municipality of Vratsa was included in the CEMIS platform as experts from the local authority provided the necessary information for the platform with the types of waste that is being collected, regularity, collection of specific and bigger waste such as furniture, electronics etc. All these aspects were discussed during the workshops, so it was very easy for the responsible experts to organize the functionalities and the information to be included. This project was not developed by the Municipality but with its support. There was a sufficient readiness level for the development of the platform thanks to its discussion within ICC.

Assessment of solution maturity - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 1			
1	Number of eco trails to be digitalized	0	0
2	Number of tourists visiting the eco trails	-	-
Solution 2			
1	Number of developed tourism web platforms for the needs of the Municipality of Vratsa	1 developed website without up-to-date information	1 developed website without up-to-date information
2	Number of visitors to the web site	-	-
3	Number of publications per month	-	-
Solution 3			
1	Number of objects of movable cultural heritage to be scanned	At least 30 000	30 000
			Not yet

These indicators will be measured through statistics of web sites; lists of hotels, restaurants and attractions attending the platform; lists of 3D scanned objects; lists of eco trails.

Assessment of solution maturity - progress against KPIs

	Where we started	Midway through the challenge	Final results
Solution 4			
1	Number of visits of the web site	20 000	167 000
2	Number of users ads on the web site	60	172
3	Number of participating cities in the platform	1	3
Solution 5			
1	Number of sensors installed in the waste bins	-	-
2	Number of surveillance cameras installed	-	-
3	Number of developed integrated waste management systems	-	-

For Solution 4 indicators are measured through the statistics provided by Magisterium Ltd. that is responsible for the CEMIS platform.

For solution 5 indicator will be measured through the documents from the public procurement procedure for the selection of contractor, invoices, technical documentation.

Assessment of solution maturity - discussion

Municipality of Vratsa works in close relations with all the representatives in the local ecosystem. Their experience and skills are very helpful for the proper development and further implementation of the solutions within ICC.

Regarding this aspect, some changes were done such as the digitalization of the eco-trails while Vrachanski Balkan National Park is responsible for them, and the organization started the implementation of a project for digitalization of some eco-trails and popular landmarks in the region after the solution was discussed within ICC. Experts from the National Park first welcomed the idea but after the approval of their project for digitalization of 10 landmarks in the park, they do not have the capacity to work on both projects at one and the same time. Another very important thing is that all eco-trails are not responsibility of the Municipality of Vratsa, but of Vrachanski Balkan National Park.

The virtual tour of the museum was a good idea during the pandemic, but for now we are trying to bring tourists back on site so separate 3D scanning of the moveable cultural heritage in Regional Historical Museum-Vratsa would be more suitable. The idea was upgraded with 3D printing of some of the most popular objects in the museum so they can be sold as souvenirs.

Digital signage was also a good idea but after discussing it with the local ecosystem and especially with the thematic tourism expert a decision for upgrading the already existing web site Open Vratsa was taken.

The Municipality of Vratsa is part of the web platform for green economy CEMIS. The platform is fact since December 2021 and it's now getting more and more popular among local citizens. It was developed by Magisterium Ltd. with most of the functionalities that were previously commented within ICC. Further development of the platform will be discussed after more Bulgarian municipalities attend the platform. New functionalities will include separate sections for citizens and business, more developed marketplace, education section and more interactive activities. Awareness raising campaigns needs to be organized as well so more people would be informed about green issues.

Assessment of city ecosystem and activities - progress against KPIs

Ecosystem		Where we started	Midway through the challenge	Final results
1	Number of online meetings	3	3	3
2	Number of face-to-face meetings	2	2	2
3	Number of involved organizations	14	10	5

Assessment of city ecosystem and activities - discussion

There are representatives of different stakeholders who work in close relations and support the Municipality of Vratsa in many initiatives so the communication with them is very easy. They are very active in different aspects of the social life in the city and come from businesses like Magisterium Ltd., Holcim Ltd. Inex Trade Ltd., Lestoproduct Ltd.; NGOs like Chamber of commerce and industry, Youth center, Youth house and many others; educational institutions in the face of kindergartens, schools and university branches; regional and local authorities such as Regional management of education, Labor Office Directorate, neighboring municipalities and settlements, municipal enterprises like “Sport and tourism”, “Social activities”, BKS; the Regional library, the Agency for regional economic development etc.

During the project implementation and the selection of the final solutions it was clear that some representatives of the local ecosystem are not relevant to be part of further discussions such as Inex Trade Ltd., Lestoproduct Ltd., Regional management of education, Labor Office Directorate. At the same time new stakeholders attended the meetings and took active part in the implementation of the solutions such as Magisterium Ltd., BKS and Eco project Ltd.

We consider that the diversity of stakeholders and their good presence on local level is an advantage for the project so we could find the proper supporter for every kind of solution.

Thanks to the active role of the local ecosystem bad ideas were identified and change with better solutions so that a greater added value will be measured at the end.

5 key lessons

Lesson	Reflections
1	Now we know how to develop a good idea/ solution to a problem, taking into consideration all different aspects that can affect its success.
2	After ICC it is easier for us to attract and involve the proper stakeholders who will help to develop a concrete idea.
3	We are more flexible, and we can change any idea in the process of its development according to the needs.
4	Before ICC we didn't use KPIs for our activities but now we can easily define indicators and we know how to monitor their implementation.
5	After ICC we know for different sources of funding such as EU City facility. We also found donations and "adoption" from local businesses as an opportunity for provision of financial resources thanks to our thematic expert.

Reflections on city collaborations

Within ICC we didn't work in close relations with other cities but during our joint meetings and speed datings we got to know some interesting good practices such as:

- Guimaraes marca or how the city produces its own products and branded promotional materials;
- The waste management system of the city of Busan in the Republic of Korea in the face of the volume-rate Garbage Disposal System;
- The city of Osijek in Croatia where there is an innovation strategy, while we do not have such strategy in the Municipality of Vratsa.

Commitments

Commitments to on-going resources

1. Further communication with potential donors for the provision of 3D scanner;
2. Searching for open application procedures for EU funding;
3. In case no other financial opportunities are found for the solutions, they will be involved in the next municipal budget for 2023.

Commitments to on-going collaboration

1. Provision of regular meetings with the relevant stakeholder for tracking the progress of the defined solutions;
2. Further communication with Vrachanski Balkan Nature Park will be organized so they will accept the idea for digitalization of the eco routes.

Commitments to on-going KPIs

1. Development of an Integrated waste management system;
2. Provision of 3D scanner;
3. Development of the existing OpenVratsa web platform with up-to-date information;
4. At least twice increased number of visits on the CEMIS platform.

3 Year plan - ambitions

Building on the ICC, what would will the city aim to achieve in 3 years time?

As a result of the implementation of an integrated waste management system new fairer methods for taxes calculations can be used – the more waste you generate, the more you pay;
The amount of separately collected waste will be at least doubled;
For the needs of Regional Historical Museum-Vratsa holograms will be introduced for more attractive experience of the visitors.

What steps will you take over the next 3 years to achieve these goals?

Funding is the greatest challenge for the development of integrated waste management system so the Municipality of Vratsa will count on EU funding. More meetings with potential contractors needs to be organized for discussing the system functionalities.
The composting installation is almost ready so more awareness raising campaigns are needed.
The Municipality of Vratsa will count on donations for the 3D scanner and holograms so further meetings with potential donors will be organized as well as with the museum representatives to discuss the functionalities,

3 Year plan - targets

KPI	Category	What commitments will the city make to this end?
1	City Performance	More active work in the organization of awareness raising campaigns on green topics More active users of the CEMIS platform Provided 3D scanner especially for old books in the Regional historical museum
2	Ecosystem	Meetings with relevant stakeholders at least once a month will be organized after the end of ICC so the work on the solutions will continue
3	Solution maturity	Full readiness level for implementation of the solutions defined within ICC and provided funding for at least two of them

Appendix

Vratsa: Additional information

ICC Transformation

February 2021 to May 2021



City Needs: bottom-up perspectives

Stakeholders as well as citizens pay greater attention and are more satisfied with infrastructure projects because their results are visible while projects with the so called “soft measures” are not so popular. However, it is important for any city to keep up with the new technologies, because they are what future generation will mainly work with. For that reason, the city needs are related to the provision of smart solutions in the process of waste reduction and optimisation. There are very good opportunities for tourism development and future intentions of the local authority are for attracting more tourists and providing more information about local events and initiatives. All that information as well as contacts of places for food and accommodation need to be collected in one digital place – a web site for tourism in the region of Vratsa, that is one of the solutions within ICC.

Another very important aspect is that sometimes digital technologies are growing faster than people's ability to handle them especially in smaller cities such as Vratsa. In this regard it's of high importance to select smart solutions that will be user-friendly for their customers especially when related to the sensitive topics like green economy and sustainable tourism. It would be a good idea for the organization of information campaigns which will show people how to work with the implemented digital and smart solutions such as web platforms, 3D printers and 3D scanners.

Section 4: City solutions and delivery strategy

Solution strategy for sustainable tourism

Solution 1: Digital solutions for improving the tourist routes in and outside the territory of Vrachanski Balkan National Park - *Digitization of eco-trails outside the territory of Vratsa Balkan National Park*

✓ *What is done:* On the territory of the park there is a network of eco-routes, for which the Bulgarian Tourist Union-Vratsa is legally responsible. BTU has been declared bankrupt and is not fulfilling its obligations and, as a result, no one is involved in the maintenance of these eco-trails. There are already several attempts in Bulgaria to create applications that are not optimal such as BGMountains online map and BG maps. Vratsa Balkan Park has a project for cross-border cooperation with Serbia for 3D routes and locations using LIDAR technology and VR glasses, but it does not include mountain marking that is one of the objectives of the solution defined within ICC. There are few routes for marking and digitalization outside the Vratsa Balkans. Such is the Botev road - Okolchitsa – Kozloduy.

🕒 *What are the objectives?:* The aim of the decision is to create up-to-date and safe routes, as well as to raise the awareness of local and incoming tourists. The director of the park and the municipality are key players and should be involved in the work. The flow of tourists is expected to increase, as with the repair of the transport infrastructure the travel time from these cities to Vratsa will be shortened. Routes for mountain climbing, cycling, etc. will be digitized later as the logic is to go from the more accessible and more mass to the more specialized. Preliminary talks have already been held with local organizations in this direction, but the target group is still smaller.

😬 *What are the difficulties?:* Lack of funding and human resources. Lack of interest in NP Vrachanski Balkan

€ *What are the sources of finance?:* Project financing through the Financial mechanism of the European Economic Area and through The Ministry of Environment and Water

Section 4: City solutions and delivery strategy

Part B Solution strategy for sustainable tourism

Solution 2: Development of an existing online platform for tourism



Things done: The platform is already existing and it is now under construction. Discussions with the owners of the website are conducted so its now clear about the responsibilities.



Description: The idea is the web site to be linked to the official web site of the Municipality of Vratsa so it will be easily accessible and its main function will be to provide tourist information. All the necessary information about accommodation, restaurants and attractions will be collected in one place.



Blockers and risks: Risk of remaining unpopular.



Business model: Project financing by America for Bulgaria and the municipal budget.

Section 4: City solutions and delivery strategy

Part B Solution strategy for sustainable tourism



Solution 3: 3D scanning and printing of moveable cultural heritage



Things done: A research about the devices and their characteristics is already done. A selection of the objects to be digitalized is also done.



Description: The solution is related to the provision of remote access to objects part of the moveable cultural heritage in RHM-Vratsa. An idea is also 3D printing of some of the scanned objects so they can be sell as souvenirs.



Blockers and risks: Lack of human resources to be part of the digitalization process



Business model: Project financing by the municipal budget, donors or CSR

Section 4: City solutions and delivery strategy

Part B Solution strategy for green economy



Solution 1: Digital solutions for citizens - raising the culture and awareness of separate collection, waste prevention, etc. Digital solution for companies with information on waste prevention

A web platform for a green economy



Things done: The web platform has been developed within another project during the past year.



Description: There is an idea for the platform to provide up-to-date information about the national and international legislation in the field of waste management to local authorities through annual subscription. The platform also will be having another section especially for business organizations where they will be able to offer their unused materials so the waste for some will be a resource to another in reference to circular economy.



Blockers and risks: Lack of interest from other municipalities to be part of the platform. Lack of interest among citizens. The platform is owned by a private company, not by the Municipality.



Business model: Operational Program Environment, The Financial Mechanism of the European Economic Area

Section 4: City solutions and delivery strategy

Part B Solution strategy for green economy



Solution 2: Integrated waste management system



Things done: There were discussions about the functionalities of the system, who will be responsible for it and what will be the budget needed for its development and implementation



Description: Optimization of the container service system by monitoring the level of occupancy; fair determination of the fees for household waste; optimization of the transport for servicing the waste containers; better separate waste collection; lead to cleaner, non-flowing containers



Blockers and risks: There are no legal obstacles; The system should be easy to manage and the software clear. The system will optimize the route schedule and the information will reach the drivers. It must therefore be easy for them to understand; It is not clear whether the information from the sensors can be recognized as a normative basis for determining the garbage fee.



Business plan: Operational Program Environment, The Norwegian Financial Mechanism

Overview of our approach to the development of KPIs to assess city

Solution	Initiative	Activities – Inputs and actions
Digitization of eco-trails outside the territory of Vratsa Balkan National Park	Preparation of a list of eco-trails and their prioritization	Collecting information about all eco-trails on the territory of the Vratsa Balkan Nature Park and beyond
	Organizing meetings between the different stakeholders, who deal with the administration of the paths	Discussion between Municipality of Vratsa, Vratsa Balkan Nature Park and RIEW of appropriate eco-trails for their digitalization as well as creation of complete routes
	Defining the technical characteristics and functionalities; Taking decision about hosting Creating content	Looking for appropriate software solutions in order to make the application more accessible and user-friendly
	Budgeting and identifying funding sources	Looking for opportunities for funding from the local budget and/ or the Structural Funds and/or EU Programs
Development of an existing online platform for tourism	Developing and upgrading with specific content;	Looking for appropriate software solutions and content creation
	Communicating with hotels and guest houses about taking part in the platform	Organization of meeting with stakeholders and especially representatives from local hotels and guest houses in order to talk about opportunities for participating in the platform
	Developing a business model with both investment and maintenance costs considered Budgeting and identifying funding sources	Looking for opportunities for funding from the local budget and/ or the Structural Funds and/or donations/ CSR
3D scanning and printing of moveable cultural heritage in RHM-Vratsa	Digitization of movable cultural heritage	Organization of meeting with RHM-Vratsa; Defining the objects that will be scanned and printed
	Developing a business model with both investment and maintenance costs considered Budgeting and identifying funding sources	Looking for opportunities for funding from the local budget and/ or the Structural Funds and/or EU Programs
Web platform for green economy	Defining the functionalities and content of the platform, the services that will be included	Organization of meetings between the public institutions and other stakeholders to discuss and agree on the services that will be provided
	Defining the technical parameters; integration with other systems	Organization of meetings between the stakeholders, the governance structure and PMO for discussion about the technical parameters of the platform and its integration with the web page of the Municipality
	Determination of points for marking the different waste streams; Creating content for citizens; Creating content for companies; Integration of the two parts	Organization of meetings with the Municipal organizational unit “BKS” Organization of meetings with stakeholders and target groups
	Business model, budgeting and funding sources	Looking for opportunities for funding from the local budget and/ or the Structural Funds and/or EU Programs
Waste management system	Defining the functionalities	Construction of a complete system for optimization of garbage collection on the territory of Vratsa Municipality
	Software development	Building of a complete smart system and development of software solutions
	Business model, budgeting and funding sources	Looking for opportunities for funding from the local budget and/ or the Structural Funds and development of a business plan