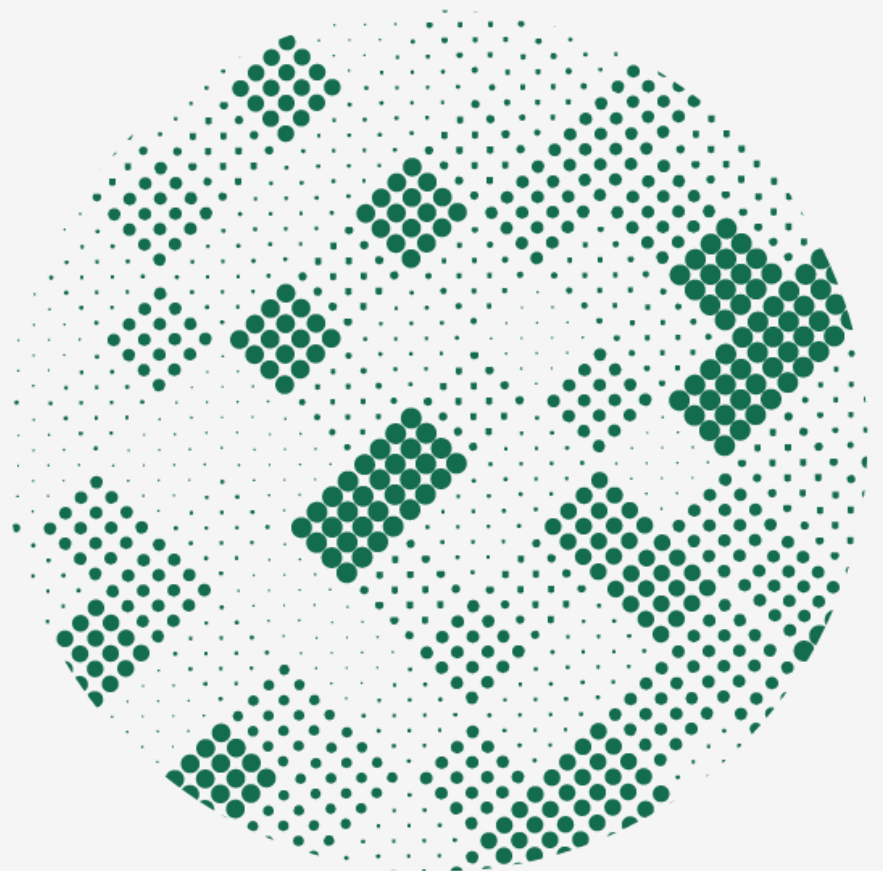




RESPONSIBLE
RESEARCH AND
INNOVATION IN
TERRITORIES

Deliverable D4.3 Transformative Outlook for Sofia Municipality



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439

© RRI-LEADERS 2023

You are free to copy, distribute and publicly communicate the texts, provided the authors and the name of the project, RRI-LEADERS, are credited. The texts cannot be used for commercial purposes nor in derived works.

This publication has been produced within the framework of the RRI-LEADERS project, funded by the European Union's Horizon 2020 research and innovation programme, under grant agreement No 101006439.

Exclusion of liability: Any opinions and views expressed in this publication are the sole responsibility of the authors and do not necessarily represent the official position of the European Commission.



www.rri-leaders.eu



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439

Deliverable D4.3

Transformative Outlook for Sofia Municipality

Deliverable leader	Sofia Development Association
Lead author	Snezhina Gabova
Contributors	Svetlana Lomeva
Editors	Svetlana Lomeva, Sevdalina Voynova (SDA) Maya Vestergaard Bidstrup (DBT) Pavlos Kilintzis (LGA-WM)
Contractual delivery date	30 September 2023
Delivery date	29 September 2023
Dissemination level	Public

Document revision history

Version	Date	Author/Contributor	Revision
Draft 1	December 2022	Snezhina Gabova	Initial draft
Draft 2	February 2023	Snezhina Gabova Svetlana Lomeva	Revised draft
Draft 3	April 2023	Snezhina Gabova Svetlana Lomeva	Draft TO
Draft 4	August 2023	Snezhina Gabova	Revised draft/inputs from internal review
Draft 4	August 2023	DBT	Comments
Draft 4	August 2023	UoWM	Comments
Draft 5	Sept. 2023	Snezhina Gabova	Final version



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439

RRI-LEADERS Partners

NO	PARTNER'S NAME IN ENGLISH	PARTNER'S NAME IN NATIONAL LANGUAGE	PARTNER'S SHORT NAME
P1	APPLIED RESEARCH AND COMMUNICATIONS FUND	ФОНДАЦИЯ „ПРИЛОЖНИ ИЗСЛЕДВАНИЯ И КОМУНИКАЦИИ“ (FONDATSIA PRILOZHNI IZSLEDVANIA I KOMUNIKACII)	ARC FUND
P2	UNIVERSITY OF WESTERN MACEDONIA	PANEPISTIMIO DYTIKIS MAKEDONIAS	UoWM
P3	THE DANISH BOARD OF TECHNOLOGY FOUNDATION	FONDEN TEKNOLOGIRADET	DBT
P4	THE CATALAN FOUNDATION FOR RESEARCH AND INNOVATION	FUNDACIO CATALANA PER A LA RECERCA I LA INNOVACIO	FCRI
P5	ZURICH UNIVERSITY OF APPLIED SCIENCES	ZURCHER HOCHSCHULE FUR ANGEWANDTE WISSENSCHAFTEN	ZHAW
P6	REGIONAL ASSOCIATION OF LOCAL GOVERNMENT OF WESTERN MACEDONIA	PERIFEREIAKI ENOSI DIMON DYTIKIS MAKEDONIAS	LGA-WM
P7	SOFIA DEVELOPMENT ASSOCIATION	АСОЦИАЦИЯ ЗА РАЗВИТИЕ НА СОФИЯ (ASSOTSIATSIA ZA RAZVITIE NA SOFIA)	SDA
P8	MUNICIPALITY OF THALWIL	GEMEINDE THALWIL	THA
P9	ECONOMIC DEVELOPMENT AGENCY OF SABADELL CITY COUNCIL	PROMOCIO ECONOMICA DE SABADELL	PES SL



Table of Contents

TABLE OF CONTENTS	5
LIST OF ACRONYMS / ABBREVIATIONS USED IN THIS DOCUMENT	6
EXECUTIVE SUMMARY	7
THE RRI-LEADERS PROJECT	8
THE RRI-AIRR FRAMEWORK	9
INTRODUCTION	11
VISUALISATION OF POLICY AREAS AND OBJECTIVES	13
INTRODUCTION TO SOFIA MUNICIPALITY	21
INTRODUCTION TO POLICY AREA: SUPPORT FOR INNOVATION	25
SYNTHESIS OF FINDINGS	26
SYNTHESIS OF FINDINGS FROM CITIZEN REVIEW PANELS IN SOFIA MUNICIPALITY.....	28
RRI FRAMEWORK.....	28
POLICY OBJECTIVES FOR AREA SUPPORT FOR INNOVATION	30
RELATION TO ONGOING POLICY PROCESSES/STRATEGIES	31
RRI-AIRR FRAMEWORK.....	31
INTRODUCTION TO POLICY AREA: DIGITAL TRANSITION AND NEW SKILLS	35
SYNTHESIS OF FINDINGS	36
SYNTHESIS OF FINDINGS FROM CITIZEN REVIEW PANELS IN SOFIA MUNICIPALITY.....	37
RRI-AIRR FRAMEWORK	37
POLICY OBJECTIVES FOR DIGITAL TRANSITION AND NEW SKILLS	39
INTRODUCTION TO POLICY AREA: YOUTH EMPLOYMENT AND ENTREPRENEURSHIP	45
SYNTHESIS OF FINDINGS	45
SYNTHESIS OF FINDINGS FROM CITIZEN REVIEW PANELS IN SOFIA MUNICIPALITY.....	47
POLICY OBJECTIVES FOR DIGITAL TRANSITION AND NEW SKILLS	47
INTRODUCTION TO POLICY AREA: SUSTAINABLE URBAN DEVELOPMENT	52
SYNTHESIS OF FINDINGS	53
SYNTHESIS OF FINDINGS FROM CITIZEN REVIEW PANELS IN SOFIA MUNICIPALITY.....	54
AIRR REFLECTIONS	58
COMMUNICATION AND DISSEMINATION	58
CROSS-CUTTING PRIORITIES	59
BIBLIOGRAPHY	60



List of acronyms / abbreviations used in this document

RRI - Responsible Research and Innovation

AIRR – Anticipation, Inclusiveness, Reflexivity, Responsiveness

R&I – Research and innovation

SDA – Sofia Development Association

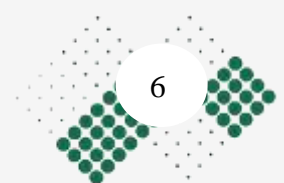
SM – Sofia Municipality

SI – Support for innovation

TO – Transformative outlook



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439



Executive Summary

The transformative outlook for Sofia Municipality is the result of the co-creation process adopted for the project. The outlook presents the policy objectives and actions for the four policy areas identified by Sofia Municipality for inclusion in the project, namely, support for innovation, digital transition and new skills, youth employment and entrepreneurship, and sustainable urban development. In addition to policy-specific actions, for each policy the outlook presents activities related to the RRI-AIRR framework. Both the actions and the RRI-related measures have been formulated and discussed in a series of stakeholder meetings and confirmed by randomly selected panel of citizens.

The transformative outlook has the potential to mainstream actions at organizational level for Sofia municipality that will improve the policymaking process, for example, institutional routines related to anticipatory, inclusive, and reflexive governance. Concrete actions are proposed to this effect, such as regular reviews and foresight exercises, communication to citizens to ensure transparency and accountability of policy implementation, stakeholder networking, etc.

The TO is aligned with current strategies and policy initiatives at municipal level. It also considers the results of various projects implemented by the municipality or local R&I stakeholders. The document also includes proposals for communication activities, aimed at informing the local government as well as citizens about the relevance of the RRI-AIRR framework and facilitating the adoption of RRI-AIRR dimensions into the policymaking process.



The RRI-LEADERS Project

RRI-LEADERS is a three-year EU-funded project (2021-2023) exploring the relevance of the principles for Responsible Research and Innovation (RRI) to territorial policymaking. The territories in RRI-LEADERS consist of three European cities and one region and will act as demonstrators for the transformative potential of RRI-AIRR on a sub-national level. Through a co-creation process involving multiple stakeholders and citizens, each territory will analyse and integrate RRI-AIRR to their chosen policy areas:



The city of Sofia (Bulgaria): Support for innovation; digital transition and new skills; youth employment and entrepreneurship; and sustainable urban development.



The municipality of Thalwil (Switzerland): Energy transitions and climate change responsiveness.



The city of Sabadell (Catalonia, Spain): Inclusiveness and alignment of the territorial innovation ecosystem with societal challenges considering sustainability, focused on the topic of active ageing.



The region of Western Macedonia (Greece): Economic transition to low-carbon economy, in particular a smooth and innovative transition from the coal value chain towards an alternative development paradigm.

The **Transformative Outlooks** is the final outputs of the co-creation process. These outlooks consist of an action plan with measures for implementing the intended transformation in each territory through the integration of RRI-AIRR as a framework for addressing territorially significant policy areas.

The following is the Transformative Outlook for Sofia Municipality.






The RRI-AIRR Framework

Originally, Responsible Research and Innovation (RRI) is an approach used to align research and innovation processes and outcomes with societal needs and expectations, including ethical considerations, promotion of gender equality, and inclusion of perspectives from societal actors. Instead of applying the elements of RRI to research and innovation activities only, this project seeks to integrate RRI into territorial governance with the aim to foster a systematic approach to responsible, science evidence-based policymaking.







The project integrates two complementary understandings of RRI: The five RRI keys and the four AIRR dimensions – making up the RRI-AIRR Framework. The RRI keys are of different conceptual natures but can be understood as *policy agendas*. The five RRI keys are: public engagement, open access, gender equality and diversity, ethics, and science education. The AIRR dimensions can be seen as *process requirements*, outlining four characteristics of an RRI process. The four dimensions are: anticipation, inclusiveness, reflexivity, and responsiveness. (Klaassen et al., 2014)

The project adopts the following understanding of RRI: “A transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products” (von Schomberg, 2011).

The understanding of RRI diverges only slightly from this definition in that it does not promote the separation of innovators from the rest of the societal actors as mentioned above and instead seeks to include all societal actors as co-creators in the innovation processes. In doing so, RRI-LEADERS’ interpretation of RRI draws heavily on the extension of the RRI framework proposed by Stilgoe, Owen and Macnaghten (2013), who emphasise the prospective notion of responsibility by introducing four dimensions of RRI – anticipation, inclusiveness, responsiveness, and reflexivity, largely known as the AIRR dimensions. RRI-LEADERS integrates these four dimensions into its methodological design and operational implementation.

RRI KEYS	
	Public Engagement is about bringing together researchers, policymakers, industry and civil society organisations and NGOs, as well as citizens, to deliberate on matters of science and technology.
	Open Access is about the practice of providing open access to scientific information that is free of charge to the user and is reusable.
	Gender Equality and Diversity is about overcoming all barriers associated with gender, age, race, ethnicity, disability, and socio-economic status, and making science, research, and innovation fully accessible to people from the widest range of backgrounds, perspectives, and experiences, across all scientific disciplines and at all hierarchical levels.



	Ethics is about conducting research in such a way that allows others to have confidence and trust in the methods and findings of research.
	Science Education is about making science education and careers attractive for young people, targeting to drastically improve science and technology-literacy in our society.
AIRR DIMENSIONS	
	Anticipation is about systematic thinking on any known, likely, plausible, and possible implications of research, innovation, policy, or action.
	Inclusiveness is about the integration of perspectives from a wide range of societal actors (including non-organised and non-institutionalised citizens and community groups) and their involvement in multi-stage co-creation processes in a wide range of policy areas.
	Reflexivity is about critically scrutinising one's own activities, commitments, and assumptions, and being aware of the limits of one's knowledge. It implies a reflection about societal circumstances to reassess practices and adjust initiatives.
	Responsiveness is about placing societal needs in the focus of plans and actions of public leadership and governance, and engaging society in the processes of policy design and decision-making, as well as policy implementation, monitoring, and evaluation.

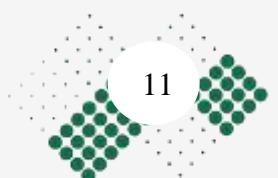


Introduction

During a period of three years, the RRI-LEADERS project has been through a co-creation process. The first step was an extensive mapping, focused on the state-of-play regarding the RRI-AIRR framework. Following this, quadruple helix stakeholders were engaged to develop ideas on the developments around the policy area and integration of the RRI-AIRR framework. Based on this input, the first draft of the Transformative Outlook was developed. Citizens were then engaged to review and validate the Transformative Outlook. Four policy areas have been chosen by Sofia Municipality for analysis and assessment regarding possibilities to integrate the RRI-AIRR framework: **support for innovation, digital transition and new skills, youth employment and entrepreneurship, and sustainable urban development.**

Mapping 2021

The first stage of the co-creation process has mapped and analysed the state-of-play regarding the RRI-AIRR framework, and has involved representatives from science, public bodies, industry, and civil society. This has provided an overview of existing practices and policy developments that have already been integrated or could integrate the RRI-AIRR Framework. **Twenty-six interviews** were conducted in Sofia, with representatives from municipal and state administration, non-governmental organisations, research and academia, as well as the business sector. Following the interviews, a **focus group** took place in May 2021, with 12 participants. Participants pointed out many important issues regarding the compatibility of the RRI framework and the AIRR dimensions with the objectives and actions envisaged in the strategies and actions plans for the selected policy areas in Sofia. The next step in the co-creation process was the **participatory workshop** held in Sofia in July 2021, with 23 participants from quadruple helix organizations. Participants agreed that the RRI keys and AIRR principles are largely known and followed by the municipal administration (in policymaking and policy implementation) even though they are not formally set in internal documents or procedural codes. Some of the strategic documents and policies in the 4 chosen policy areas explicitly mention RRI keys such as public engagement, open access, and science education as necessary for policy implementation and evaluation; others do not refer to any of the RRI thematic keys but mention principles which *de facto* follow the logic of RRI-AIRR. While correspondence to national and EU-level policy objectives is pursued, not much emphasis is placed on transforming territorial development through the sustained application of the RRI-AIRR approach at all stages of the policy-making cycle – from baseline analysis to implementation and impact assessment. **Four additional focus groups were held in November and December 2021**, with each of the quadruple helix partners (policy makers, NGOs, academia, and business).



Focus groups provided a structured, in-depth analysis of how the RRI-AIRR framework can be integrated in the long-term vision of the city.

Stakeholder
Engagement
2022

An iterative Delphi survey was implemented to obtain opinions from experts on how RRI-AIRR can be integrated in each territory. From February through May 2022 over 40 experts from quadruple helix stakeholders took part in a 3-round Delphi survey. Ideas and proposals from the Delphi survey were subsequently validated in a World Café event with over 20 representatives of stakeholders. The output of the collaborative events was the initial draft of the TO.

Citizen En-
gagement
2023

In the last stage of the co-creation process, a Citizen Review Panel with 27 participants reviewed and validated the Transformative Outlook objectives by suggesting improvements to the objectives and actions herein. A follow-up stakeholder workshop reformulated the statements made by the citizens into actionable proposals. This resulted in a revised version of the TO.

Endorsement
2023

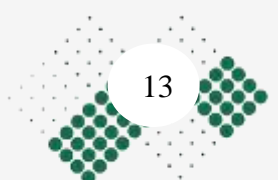
The final version Transformative Outlooks will be formally presented to municipal councilors and experts at the end of 2023. Specific attention will be put on actions with the highest potential for integration within current policies and initiatives.



Visualisation of Policy Areas and Objectives

The tables below present the policy areas, objectives, actions and RRI measures for each policy objective.

Policy Area	SUPPORT FOR INNOVATION
Objective 1	Sofia launches large-scale mission-oriented research and innovation projects as a contribution to the socio-ecological transformation of the city.
Action 1.1	Establish a unit in Sofia Municipality to coordinate the collaboration with academia, business associations and NGOs in defining the objectives and impact pathways of innovation-driven city policies.
Action 1.2	Revise the Innovation Strategy for Smart Specialization of Sofia, to support innovation planning and governance at local level.
Action 1.3	Build horizontal communication links with stakeholders from research and academia, the private and civic sectors to support open innovation policies.
Action 1.4	Apply the living lab approach to experiment and scale out/up innovations (social, technological) throughout the city.
Action 1.5	Prioritize local business/technology sectors for funding (through the Municipal Guarantee Fund, InvestSofia, etc.) to achieve policy objectives.
Action 1.6	Identify new fundraising opportunities from local and global sources, individual donors, EU funds to support mission-oriented projects.
Main RRI Measures	
Public engagement	Appoint an officer to plan and maintain R&I community engagement across municipal programs through face-to-face events and in social media platforms.
Open access	Research and innovation projects funded by the municipality shall be required to follow open access policies and make their results available to third parties.
Gender equality and diversity	To support mainstreaming of gender equality and diversity, the municipality shall require all partner organizations (subcontractors, service providers, research organizations, etc.) to adopt institutional gender and diversity plans.
Ethics	Establish a municipal ethics review board for evaluating research proposals, procurement bids, programming documents, funding instruments to ensure that they are fair, gender-balanced and inclusive.
Science education	Promote the innovative achievements of research institutes, universities, businesses through the media, dedicated public events, to facilitate the adoption of ideas and outputs in territorial governance and the provision of public services.
Objective 2	Build and brand Sofia as an attractive location for top international researchers and R&I units of international corporations
Action 2.1	Establish a unit in Sofia Municipality to coordinate multi-annual research and innovation programs with the R&I community.
Action 2.2	Identify new fundraising opportunities from local and global sources, i.e., grants and donations, sponsorships, EU funds to support the implementation of research and innovation projects.



Action 2.3	Strengthen networking and collaboration with international research and innovation hubs through EU-funded networks and programs, to align local R&I priorities with EU-level initiatives.
Action 2.4	Build strategic partnerships with European R&I and technology centers to support the recruitment, retention and development of key research staff of local innovation hubs/centers.
Main RRI Measures	
Public engagement	Appoint an R&I officer to support cross-sector stakeholder contacts and collaborations, through communication channels, events, building alliances for innovation, etc.
Open access	Provide open access to research results for start-ups and innovation companies to develop digital/social/green innovations; prioritize innovations that address problems in the municipality.
Gender equality and diversity	Require gender equality & diversity plans from local R&I stakeholder organizations.
Ethics	Establish ethics review boards to assess research applications/proposals for funding; integrate ethics requirements in the recruitment and selection procedures of funding programs.
Science education	Invite Q4 stakeholders to regular consultations for input to policy objective.

Objective 3	Innovative municipal administration: Build governance and administrative capacity for implementing public sector innovations to make Sofia a smart city
Action 3.1	Pilot innovations in specific sectors and municipal units through small-scale interventions, which are then scaled up.
Action 3.2	Develop and implement Flagship projects for innovation in the public administration.
Action 3.3	Establish a Public Sector Innovations Lab (PSIL) to support public sector innovations in cooperation with QH stakeholders.
Main RRI Measures	
Public engagement	Run annual open competitions in which citizens select public sector initiatives to be implemented [based on the model of the annual initiative <i>Sofia Chooses</i>]
Open access	<ul style="list-style-type: none"> • Introduction of open access to data and information for administrative operations and public service delivery. • Citizens monitoring and control of the implementation of open data policies.
Gender equality and diversity	Innovations to be implemented should undergo a gender equality and diversity assessment; ensure administrative units have diversity and gender equality plans with mandatory training for municipal staff, compliance checks and mechanisms for reporting GED violations.
Ethics	Establish a municipal ethics review board for evaluating research proposals, R&I programming documents, funding instruments to ensure that they are fair, gender-balanced and inclusive.



Science education	Attracting experts from other fields to management positions in Sofia Municipality to aid the coordination of the PSI Lab.
-------------------	--

Policy Area	DIGITAL TRANSITION AND NEW SKILLS
--------------------	--

Objective 1	Improve the technical infrastructure and connectivity in Sofia Municipality through smart, environmentally friendly, user-friendly, and cost effective solutions by 2025
Action 1.1	Ensure active collaboration and support to joint projects with the IT sector and private companies to design technical solutions for digitalization.
Action 1.2	Increase the capacity and digital competencies of the administration; train and retain local talent (within the administration).
Action 1.3	Participation in pan-European initiatives and applying to EU programs to build state-of-the-art technical infrastructure.
Action 1.4	Maintain and expand the zones with free Wi-Fi access in the city.
Main RRI Measures	
Public engagement	Develop an annual communication and public engagement plan for the municipality, including the organization of competitions for start-ups to develop innovative solutions, pilot projects commissioned by the municipality, etc.
Open access	The municipal directorate InnovativeSofia should draw up an open access regulation, facilitating third-party access to data and development of technology solutions.
Gender equality and diversity	<ul style="list-style-type: none"> Establish a gender and diversity board to assess all digital transition projects; regular consultations with gender and equality experts to ensure the proposed technical solutions are free of systemic bias and any form of discrimination. Develop guidelines for the municipal administration and subcontractors on building gender-neutral tech systems.
Ethics	Appoint an ethics board to assess all technological solutions to ensure they meet ethical standards. Since Sofia is part of the initiative The Cities Coalition for Digital Rights, use that expertise to develop ethics guidelines for the municipal staff and stakeholders.
Science education	Include in the annual communications and public engagement plan specific measures for researchers and innovators to share the results of their work to both citizens and decision-makers.

Objective 2	Provide an accessible, affordable, and inclusive digital environment for vulnerable groups through new social e-services by 2025
Action 2.1	Conduct biannual needs assessment to identify gaps and opportunities for e-service provision to the target groups with their involvement.
Action 2.2	Introduce financial instruments to support the development of technological solutions in partnership with the local IT sector and target groups.



Action 2.3	Provide information, training, and access to digital devices and digital services to the target groups.
Main RRI Measures	
Public engagement	<ul style="list-style-type: none"> • Develop an annual public engagement plan for the municipality, involving the target groups in finding solutions and their implementation. • Increase the use of online consultation platforms to allow individuals and stakeholders to participate in public consultations.
Open access	The municipal directorate responsible for digital transition to draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	<ul style="list-style-type: none"> • Establish a gender and diversity board to assess all digitalization projects; regular consultations with gender and equality experts to ensure the proposed technical solutions are free of systemic bias and any form of discrimination. • Promote provisions concerning senior citizens' access to digital services.
Ethics	<ul style="list-style-type: none"> • Appoint an ethics board to assess all technological solutions to ensure they meet ethical standards. • Since Sofia is part of the initiative Cities Coalition for Digital Rights, use the expertise to develop ethics guidelines for the municipal staff and stakeholders. • Regular monitoring of the implementation of the policy to ensure ethics standards, digital rights and security regulations are embedded in the digital solutions.
Science education	Provide in-person and online training to the target groups on using digital services.
Objective 3	Sofia adopts regulatory framework with standards for digital rights, data security, transparency, and trustworthy technological solutions, applicable to research, innovation and business stakeholders and IT entrepreneurs.
Action 3.1	Adopt a new open data policy to optimize the dissemination of information to the public as well as the internal communication within the administration by 2025.
Action 3.2	Develop a framework with applicable standards for the administration, research, business and civil society stakeholders (opportunity to include RRI keys).
Action 3.3	Appoint a municipal officer responsible for digital rights and digital citizenship issues to serve as liaison to the business and research community.
Action 3.4	Digitalisation of administrative processes and services. Establishment of a virtual office and information desk of Sofia Municipality.
Main RRI Measures	
Public engagement	<ul style="list-style-type: none"> • Initiate a public consultation process on the regulatory framework to discuss the scope and implementation of digital rights; engage with research and business institutions for standardisation and mechanisms to ensure transparency, security and data privacy.



	<ul style="list-style-type: none"> Organize communication events to inform the public about digital rights and implications for accessing public e-services and digital infrastructure.
Open access	<ul style="list-style-type: none"> The municipal directorate responsible for digital transition to draw up an open access regulation, facilitating third-party access to data and development of e-service solutions, observing the standards of the new regulatory framework. Conduct regular review of the ethics of data capture and sharing of data.
Gender equality and diversity	Establish a gender and diversity board to assess all digital transition projects; run consultations with gender and equality experts to ensure the proposed framework and technical solutions are free of systemic bias and any form of discrimination; include provisions for monitoring the exercise of digital rights, complaint and redress procedures.
Ethics	<ul style="list-style-type: none"> Appoint an ethics board to consult the preparation and implementation of the regulatory framework; regularly assess the implementation. Organize expert and public discussions on ethical standards and their integration in digital applications, including on AI and its use in public e-services and communications.
Science education	Organize public information campaigns on digital rights, data security, transparency and trustworthy technological solutions (including AI); develop easy-to-understand information materials for vulnerable groups.

Objective 4	Together with the local business sector, the educational sector and research institutions, Sofia develops framework conditions that ensure the availability of highly skilled workers for the digital industry.
Action 4.1	Update the Digital Transformation Strategy of Sofia to define a plan for continuous upskilling and reskilling of municipal staff.
Action 4.2	In collaboration with local universities and the business, develop joint programs to transform local students and workforce into digital talent.
Action 4.3	Design and implement an up-skilling program for micro businesses and SMEs to take advantage of opportunities that emerge because of digital developments.
Main RRI Measures	
Public engagement	Raise awareness about the unprecedented opportunities for learning and training offered by digital technologies.
Open access	The municipal directorate responsible for digital transition to draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	Establish a gender and diversity board to assess all digital transition projects; run consultations with gender and equality experts to ensure digital education and employment frameworks are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.



Ethics	Appoint an ethics board to consult the preparation and implementation of the regulatory framework; regular assessment of the framework implementation to ensure ethical standards are observed.
Science education	Organize public events to discuss different types of new/ emerging digital technologies and ways that they can be used for reskilling and upskilling.

Policy Area	YOUTH EMPLOYMENT AND ENTREPRENEURSHIP
-------------	--

Objective 1	The higher education system can impart strong basic skills as the foundation for teaching work-relevant capabilities at all qualification levels to benefit city areas of economic leadership by 2030
Action 1.1	Strengthen the collaboration with research institutes, businesses and municipal enterprises for innovative entrepreneurship education and youth employment.
Action 1.2	Develop and test smart solutions to urban problems in co-operation with universities and research institutions in Sofia.
Action 1.3	Improve the ecosystem governance to support young innovators and start-ups in the city.
Main RRI Measures	
Public engagement	<ul style="list-style-type: none"> Develop an annual public engagement plan for the municipality. Increase the use of online consultation platforms which allows individuals/businesses to participate in public consultations.
Open access	The municipal directorate responsible for digital transition to draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	<ul style="list-style-type: none"> Development, implementation, and evaluation of the funding programs in collaboration with youth organisations to ensure fair and transparent selection. Establish a gender and diversity board to assess all projects; run consultations with gender and equality experts to ensure education and employment frameworks are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.
Ethics	Appoint an ethics board to consult the preparation and implementation of entrepreneurship and employment programs to ensure ethical principles are respected.
Science education	Regular surveys among young people, innovators, founders of start-ups to anticipate long-term needs and plan appropriate financial instruments.

Objective 2	Financing an innovative Start-ups Program and introducing new financial instruments for youth entrepreneurship by 2030.
Action 2.1	Development of mentoring programs and providing conditions that support young entrepreneurs in testing and implementing their ideas.
Action 2.2	Establish a digital and physical space for start-ups in Sofia - development of new or customization of an existing e-platform for start-ups and scale-ups.



Action 2.3	Collaboration with businesses and European programs to provide additional funding for young entrepreneurs.
Action 2.4	Develop a policy for innovation and start-ups in collaboration with research units and businesses (incorporated in Sofia's RIS).
Main RRI Measures	
Public engagement	The funding programs should include requirements about open access, gender equality, ethics and public engagement policies by the applicants.
Open access	The municipal directorate responsible for digital transition should draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	Development, implementation, evaluation of the funding programs in collaboration with youth organisations.
Ethics	Appoint an ethics board to consult the preparation and implementation of the funding programs.
Science education	Regular surveys among young people, innovators, founders of start-ups, etc. to identify long-term needs and plan appropriate financial instruments in collaboration with them.

Objective 3	Include gender equality and diversity measures in a revised Youth Strategy of Sofia Municipality by 2025.
Action 3.1	Conducting joint consultations with youth organisations, which are active in the Advisory Council on Youth Policies at Sofia Municipality.
Action 3.2	Organize forums with the participation of stakeholders (academia, civil society organizations, business, state administration) to discuss targeted measures and actions to reach the objective.
Action 3.3	Carry out extensive information campaigns and provide support to organizations, working on the topic.
Main RRI Measures	
Public engagement	Public discussions about the measures and the implementation of the Youth Strategy, involvement of youth organizations in the process of reporting and evaluation of results.
Open access	
Gender equality and diversity	Establish a gender and diversity board to assess all start-up proposals; run consultations with gender and equality experts to ensure the proposed financial instruments are free of systemic bias and any form of discrimination; include provisions for monitoring the implementation of the GED measures in the Youth Strategy.
Ethics	Appoint an ethics board to consult the preparation and implementation of the funding programs.
Science education	Ensure that formal and non-formal STEAM opportunities are discrimination-free and sensitive to gender dimensions and impact of research.



Objective 4	Facilitate access by young people to decision-making bodies and prepare the new generation of public leaders
Action 4.1	Promote training and work offers aimed at young people in Sofia
Action 4.2	Enable young people to quickly assume their first responsibilities through mentoring programs and internships at Sofia Municipality
Action 4.3	Initiate projects through the Public Sector Innovations Lab (see above Policy Area Support for Innovation, Objective 3, Action 3.3,) to encourage careers in the city administration for young people.
Main RRI Measures	
Public engagement	Developing an annual communication plan with measures to attract young talent to the municipal administration.
Open access	
Gender equality and diversity	Establish a gender and diversity board to assess all employment projects; run consultations with gender and equality experts to ensure education and employment programs are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.
Ethics	Appoint an ethics board to assess all recruitment and hiring procedures to ensure they meet ethical standards.
Science education	

Policy Area	SUSTAINABLE URBAN DEVELOPMENT
-------------	-------------------------------

Objective 1	Smart and sustainable urban solutions in Sofia Municipality comprise technological, organizational and social innovations, which are developed in an integral and interdisciplinary manner across different sectors and industries and always involve the citizens.
Action 1.1	Introduce pre-commercial public procurement to support innovative solutions for municipal services.
Action 1.2	Digitalize and organize administrative processes of relevance for the municipal economy as efficiently and cost-effectively as possible.
Action 1.3	Develop and implement technological and social solutions for the CO ₂ -neutral urban and regional transport of passengers and goods.
Action 1.4	Carry out social and economic impact assessment of policies for sustainable urban development.
Main RRI Measures	
Public engagement	<ul style="list-style-type: none"> • Develop an annual municipal communication and public engagement plan. • Increase the use of the city online communication platform for public consultations.



Open access	Create databases with solutions and open access tools that can be used by R&I stakeholders.
Gender equality and diversity	Establish a gender and diversity board to assess all urban development projects.
Ethics	Appoint an ethics board to consult the preparation and implementation of urban development projects.
Science education	Engage experts from the industry, academia and NGOs to ensure research results are adequately communicated to policy- and decision makers.

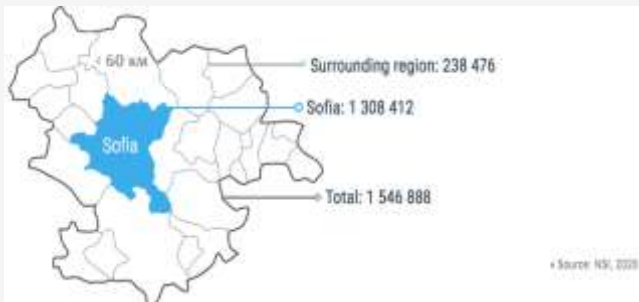
Objective 2	Increase the administrative and expert capacity of Sofia Municipality
Action 2.1	Develop continued training programs for the municipal administration by 2025.
Action 2.2	Create appropriate incentives for career development in the administration.
Action 2.3	Organize design seminars and innovation camps for the municipal administration and stakeholders for capacity building and exchange of expertise.
Main RRI Measures	
Public engagement	Develop an annual communication and public engagement plan for the municipality.
Open access	Draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	Establish a gender and diversity board to ensure training programs are free of systemic bias and any form of discrimination.
Ethics	Appoint an ethics board to consult the preparation and implementation of the training programs to ensure ethical standards are observed.
Science education	Engage experts from the industry, academia and NGOs to develop state-of-the art learning content and delivery formats.

Introduction to SOFIA MUNICIPALITY



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439

Sofia is the largest city in Bulgaria; it accommodates the legislative, executive and judiciary power in the country and is the financial, educational, cultural, business, and commercial centre of the state. Sofia is the 14th largest city in the European Union with the population of approximately 1.4 million (1.6 million with the surrounding region), which is 23% of Bulgaria’s population. Also, Sofia accounts for 25% of the labour force in the country.¹ Compared to most of the other municipalities, Sofia features good demographic indicators. The constant influx of young, active people is key to the capital’s economic potential, supporting the development of the most dynamic industries.²



Sofia is the undisputed hub of tertiary education in the country – 23 of the 52 accredited higher education institutions in the country are in the capital. The national rating system of higher education institutions in Bulgaria ranks universities in Sofia at the top in terms of student performance in nearly all professional fields. Sofia has a competitive human capital of well-educated and experienced professionals, especially engineers and IT specialists (the city ranks 3rd in Europe and 10th worldwide in terms of the absolute number of certified IT professionals.)³

According to the National Statistical Institute, Sofia’s GDP is €22.7 billion, with a GDP per capita of €17,097. Sofia accounts for 40% of the national GDP, 1/3 of the export from Bulgaria and 1/6 of manufacturing. Leading sectors in the city include ICT; trade and repairs; creation and distribution of information and creative products, telecommunications; transport; administrative and support activities; science and research; healthcare and social work; real estate.

Furthermore, Sofia offers one of the highest Internet speeds in Europe and has a vibrant start-up and entrepreneurial ecosystem, which has been developing rapidly in recent years. The ICT sector is one of the priority sectors, accounting for 19% of the economy of the city. Sofia is also a growing Fintech and artificial intelligence destination and ranks among the top 3 global service locations in Central and Eastern Europe, as it has a very well-developed business process outsourcing and shared services centres sectors. Other high-tech sectors in Sofia include creative industries, the film industry, the gaming sector, the automotive, robotics and aerospace sectors.⁴

Policy areas in the focus of RRI-LEADERS project

¹ *Sofia Business Guide* by the ‘Digitalization, Innovation and Economic Development’ department of Sofia Municipality, available online at: https://innovativesofia.bg/wp-content/uploads/2020/03/Business-Guide-2020_English_web.pdf

² https://investsofia.com/wp-content/uploads/2022/07/Sofia_Business_Guide_eng-2021.pdf

³ <https://investsofia.com/wp-content/uploads/2019/04/Overview-of-The-Start-up-and-Innovation-Ecosystem-in-Sofia-May-2019.pdf>.

⁴ Ibid.



Sofia Municipality is committed to creating strong innovation ecosystems and transforming the city of Sofia and surrounding communities into smart and sustainable places where people enjoy living and working. To achieve these goals, concerted efforts and investments are needed not only from the city administration but also from key stakeholders and partners from the industry, research and academia, civil society organisations and citizens.

The ambition is to build Sofia as an innovative city that employs digital technologies, policy and financial instruments to improve the efficiency of urban operations and public services, the economic, social, and cultural environment, citizen well-being and quality of life, while ensuring that the needs of present and future generations are met in an equitable manner.

These objectives are defined in key strategic documents, namely, the *Innovation Strategy for Smart Specialisation of Sofia*,⁵ the *Strategy for Digital Transformation of Sofia*⁶ (adopted in 2020), *Sofia Youth Strategy 2017-2027*,⁷ and the *Vision for Sofia 2050*,⁸ which outlines the priorities for the development of Sofia and its suburban areas until 2050.

The four policy areas, chosen by the Sofia Municipality for the RRI-LEADERS project are fully in line with these strategic documents. The policy areas include: 1) support for innovations, 2) digital transition and new skills, 3) youth employment and entrepreneurship, and 4) sustainable urban development.

The mapping and research conducted so far have reinforced some of the already established policy priorities; have called for rethinking and reformulating some of those objectives and solutions; and have also outlined new fields for exploration and (expert and citizen) engagement. The solutions that have the potential to generate change and impact are summarized below and are described in more detail in the sections dedicated to each policy area that follow.

1. Inclusion of science- and research-based policymaking in the organizational standards and practices following a whole-of-administration approach. If this does not happen, RRI and AIRR reduce their transformative capacity, becoming, so to say, only a tick-in-a-box procedure. Hence the importance of adopting a mainstreaming approach that considers RRI and AIRR as a framework influencing all aspects of governance and operations of the administration (procedures, structures, norms, culture, motivations) as well as all its functions (e.g., strategic planning, investment, etc.)

2. Managing and organizing innovation. The municipality must pay structural attention to innovation so that the results of research can be integrated into existing administrative routines and policies. This can be done by setting up a municipal R&I team to coordinate internal processes and communication with external parties.

3. Strengthening the city research capacity. Developing urban local and regional research ecologies that interact, reflect and act together is necessary for handling the emergence of multiple accelerating and

⁵ https://www.sofia.bg/documents/20182/448750/ISIS_Sofia.pdf/f51fcd5a-2973-4679-89fe-62b3dccb6662 (in Bulgarian)

⁶ <https://innovativesofia.bg/en/strategies-and-policies/>

⁷ https://www.sofia.bg/documents/20182/448750/Strategy_young_people-SO-2017-2027.pdf/8186ee54-8135-42e0-bfa2-17dd2b281742 (in Bulgarian)

⁸ <https://vizia.sofia.bg/vision-sofia-2050/>



accumulating crises, like the coronavirus pandemic, in-migration, climate changes. Ensuring good structural and administrative support for stakeholder collaborations is needed to develop resilient response capacities which can survive political power shifts.

4. Building a modern, digitally savvy administration. Digital transition requires local government to contribute to a digitally enabling working environment which means changing leadership models, organisational structure, learning culture and ways of working. This includes also developing a broader digital skills strategy for society as a whole ensuring all are equipped with the necessary skills to thrive in the digital age and public servants have the skills that support digital government.

5. **Including evaluative measures** into the governance framework: specific metrics and indicators adaptable to the conditions in which the RRI-AIRR framework is used should be integrated. Evaluation criteria should be set in line with the aims and objectives of the specific policy.

6. **Rethinking and redefining principles** of gender equality and diversity, considering various gender dimensions of policy impact, generational differences, minority groups, intersectional discrimination, etc.



Introduction to Policy Area: SUPPORT FOR INNOVATION

Sofia is home to one of the most developed innovation and start-up ecosystems in Central and Eastern Europe. In the last several years Sofia has managed to attract top talent from all neighboring countries and has become an important entrepreneurial hub. Sofia was the first municipality in Bulgaria to draft its own strategy for smart specialization in 2016 – the *Innovation Strategy for Smart Specialization of Sofia*⁹ which focuses on two of the four sectors from the national Smart Specialization Strategy, that is, Informatics and ICT and new technologies in the creative and recreational industries. The strategic priorities in the IS3 include securing financial capital and access to the market for innovative SMEs and start-ups, development of digital technologies, regional specialization.

Key quadruple helix (QH) stakeholders are organized in a number of clusters (in robotics and AI, automotive, biotech, cultural and creative industries) and knowledge and tech transfer centers, such as Sofia Tech Park and INSAIT.¹⁰ According to the EU Innovation Scoreboard, Bulgaria is an Emerging Innovator¹¹ with performance at 45.2% of the EU average, whereas the region in which Sofia is located (Yugozapaden NUTS2), ranks a step higher, that is, an Emerging Innovator+.

The policy and operational framework regarding innovation is elaborated in two main documents, the *Innovation Strategy for Smart Specialization of Sofia – IS3 (2016-2026)* and the *Integrated Municipal Plan for Urban Development 2021-2027 (Programme 2030)*. While there is need for better policy coordination and strategic alignment of visions, these documents outline overarching priorities aimed to transform Sofia into a smart, innovative, sustainable city. The policy initiatives proposed in this area aim to strengthen the innovation ecosystem at municipal level and build capacity for public sector innovations; improve internal government operations; facilitate efficient communication with citizens and institutional partners; improve citizens' well-being.

The *Innovation Strategy for Smart Specialization of Sofia* identifies three areas of challenges and respectively, objective, which need to be addressed: (a), capacity building and market access, including support for building a centre of excellence in both the ICT and the creative industries; attracting leading investors to invest in R&D; development of ICT scientific and innovation infrastructure; and (b) financial capital, establishment of new mechanisms for incubation and financing (particularly in the early stages), and facilitating foreign investments and venture capital opportunities in Sofia. A third area of challenges is identifying sources of funding for the IS3 implementation.

Monitoring and evaluation of the IS3 is entrusted to a Monitoring Committee, which reports to the Mayor of Sofia Municipality. The Committee is comprised of international and Bulgarian experts – researchers and entrepreneurs in the field of innovation, education, and science. The MC works in cooperation with the two consultative councils at the Mayor's Office: Expert Council on Science, Technology and Innovation and the Advisory Council on Economic Policy and Finance.

⁹ https://www.sofia.bg/documents/20182/448750/ISIS_Sofia.pdf/f51fcd5a-2973-4679-89fe-62b3dccb6662 (in Bulgarian)

¹⁰ Institute for Computer Science, AI and Technology, <https://insait.ai/about-insait/#What-is-INSAIT>

¹¹ https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-bg.pdf



Synthesis of Findings

The strategy for smart specialization promotes a quintuple helix model of implementation; document analysis has shown that principles close to the RRI keys have been observed in drafting the strategy, namely, integrated approach (i.e., synergy with related policies); partnership and teamwork, transparency, and citizen participation. “Integrity” and “protection of public interest” are put forward as leading principles for implementation.

According to experts in the **interviews, focus groups and participatory workshop**, the current IS3 needs revision, as it does not adequately address issues deriving from the twin transitions, digital and green (the strategy was elaborated in 2016). It also does not reflect new developments in research and practice linked to regional specialization, for example, the concept of regional innovation valleys and priorities outlined in the [New European Innovation Agenda](#), adopted in 2022.

Concerning stakeholder engagement, Sofia Municipality is expected to support innovation through commissioned studies and research (the results of which can feed into municipal policies). In terms of RRI-AIRR keys, gender equality and ethics are not embedded in all aspects. Although not specifically mentioned, AIRR dimensions linked to anticipatory, responsive, and reflexive governance are embedded.

With respect to inclusive policy making and public engagement the needs of vulnerable groups and of people with disabilities need to be addressed. In 2021 the municipality has set up a committee to consult and oversee the implementation of a range of measures (regulatory, technological, communication) aimed at people with hearing disabilities.

Whereas various initiatives are implemented to support technological innovations and start-ups, less attention is paid to innovations in the public administration sector.

The objectives and solutions for policy area Support for Innovation received the lowest level of consensus from the **Delphi participants**. Improving the capacity and expertise of the municipal administration, transition to digital services, and ongoing communication with the citizens have drawn the support of most of the participants in Delphi. Only two solutions out of those included in the Delphi in policy area Support for Innovation have received 100% support from the participants. The first one deals with establishing partnerships with private funds to create new municipal grant programs for start-ups and entrepreneurs. The second one urges for the provision of **open access, open data policies and information sharing**.

Overall, findings indicate a need to develop new business and governance models, mobilize new partnerships and investments, and foster market uptake of visionary solutions and approaches to enhance urban resilience. An updated IS3 should be premised on the importance of the cities as nodes of global networks of skills, knowledge and capital and the added value of connectivity and collaborative networks of stakeholders as central to innovation. In alignment with EU level initiatives for innovation (e.g., RIS3, City Science Initiative, Smart Cities), the future smart specialization policy should aim to increase the relevance of local/regional research for city challenges.

The following areas for improvement are proposed:

- The new RIS3 and innovation policy needs to address grand societal challenges, following a mission-oriented innovation policy approach. The aim of mission-oriented innovation policy is to redirect technological change from existing trajectories towards more economically, socially, and environmentally



beneficial pathways, which rely on anticipation, inclusiveness, public engagement, and integrity – considering the interests of current and future generations.

- Focus in the current IS3 is placed primarily on support to technology-related innovation whereas **social innovations** and **public sector innovations** are less extensively covered. A new policy should embrace technological as well as place-based and social innovation, allowing the city to shape policy choices according to its unique socio-economic conditions.
- Innovation **agenda setting** should not be a top-down process, but an **inclusive process of stakeholders' involvement** in which research and industry actors offer input about new activities and the local government assesses the outcomes, providing support to initiatives with the highest potential for transformative impact.
- Since the current IS3 was first developed in 2016, it does not include specific priorities linked to most recent EU policy initiatives, such as the Green Deal and digital transition. A new policy should investigate areas where the twin transitions could escalate existing **inequalities and vulnerabilities** and/or risk increasing inequalities, including dedicated explorations where the effects of the two transitions mutually reinforce or mitigate each other.
- The policy should be **socially inclusive**. An inclusive policy has the objective to provide all segments of society with equal opportunities to successfully participate in and benefit from innovation, technological and social change.
- Addressing potential adverse **social impacts of technological innovations** through a better policy mix between innovation and other policy areas such as social services, education, employment, etc., of vulnerable populations, while mobilizing them to participate in policymaking.
- The innovation policy should be **territorially inclusive** to foster the innovation capacity of individuals and stakeholders located in peripheral areas, as well as in disadvantaged neighborhoods within large urban areas, and allow rural-urban diffusion of knowledge and innovation.

The following strategic priorities and recommendations have been identified for the policy area by the participants in the co-creation events:

1. Recognizing the potential of civil society to co-create innovative solutions to urban challenges and contribute to the construction of public policies in all levels of territorial government.
2. Developing knowledge and tech transfer processes (like pre-commercial procurement) that enable civic players, young people, citizens, local start-ups and SMEs to become promoters of new solutions to societal goals.
3. Tailor financial instruments to research that is relevant to local challenges. Having a single point of contact for research cooperation in local government can contribute to more effective collaboration between academia and public bodies.
4. Increasing municipal support to innovation through commissioned studies and research (the results of which can feed into municipal policies); public procurement procedures can be revised and adapted to include provisions in support of RRI, thus increasing the role of the municipality as both a leader and end user of scientific innovations.
5. Ensure that the innovation policy stimulates synergies vs. policy siloes; as the factors and nature of innovation become more multidisciplinary and complex, innovation policy co-ordination is required across different policy areas such as education, digital transition, sustainable urban development.



Synthesis of Findings from Citizen Review Panels in Sofia Municipality

A citizens' review panel (CRP) was held in May 2023, with 27 participants from various ages, educational and professional backgrounds, from around the city. Out of the original actions, proposed in the first version of the transformative outlook, roughly 1/3 have received support, i.e., they were considered acceptable without significant modifications. The highest level of consensus was received for the actions linked to 1) increasing the expert capacity and skills of the administration, through regular personnel appraisal; 2) comprehensive impact assessments of the economic and social impact of policies, in addition to ecological impact assessment; 3) attracting and retaining young people to work in the administration, and 4) using the approach of the living labs to test policies and policy measures before mainstreaming them.

The new actions proposed have a strong focus on sustainable urban development (such as traffic safety, age-friendly and disability-friendly city infrastructure, waste management); they have been included in the TO following the reformulation by the stakeholder workshop. Other actions focus the attention on young people, such as holding an annual The Future of Sofia conference, to set priorities for youth policies. Communication with the citizens, more public consultations and having citizens contact points in the administration were also emphasized as ways to improve the citizens engagement in the policy cycle.

During the subsequent **stakeholder workshop** (held in June 2023) participants largely accepted the initial activities proposed in the TO. Some of the proposals made by the citizens were considered ineligible since similar activities are already partially or fully implemented by the municipality. The issue here is that if the city administration does not regularly communicate to the citizens, they may not always be well-informed about ongoing initiatives which affects the quality of their input in public consultation forums.

Citizens generally agreed that gender equality is not a significant problem in the four policy areas; stakeholders were divided on that topic, but tended to agree that no specific measures are needed at policy level concerning diversity.

One statement drew overwhelming support from the stakeholders, that access to data collected by the municipality should be restricted. This is a rather surprising response, but it may reflect a misunderstanding of the principles of open data.

RRI Framework

Regarding the RRI-AIRR framework, four groups of challenges were identified during the analytical and mapping activities. Recognizing **the potential of civil society** to co-create innovative solutions to urban challenges and contribute to the construction of public policies is one of the major recommendations made by stakeholders. A **transformative innovation policy** is expected to address a wide range of societal challenges, aimed to channel socio-technical systems into socially desirable directions and embeds processes of change in society.¹²

Rationale for including the individual RRI Keys in policy area Support for Innovation

¹² <https://www.oecd-ilibrary.org/sites/9748266c-en/index.html?itemId=/content/component/9748266c-en>



The RRI-LEADERS project is premised on the argument that responsible policymaking encompasses translating RRI/AIRR-informed theoretical assumptions (research) and empirical evidence into policy objectives, and policy objectives are converted into actions. Policy implementation (practice) that is aligned with RRI/AIRR requires a collaborative mode of work with Q4 stakeholders (combining top-down and bottom-up perspectives); in this process inputs are equally shared; levels of power and influence are shared rather than hierarchical.

For each policy objective in the TO, related RRI measures are proposed. The respective RRI section provides concrete proposals on how to operationalize RRI/AIRR for good governance (which is anticipatory, reflexive, inclusive, responsive) and integrate it in policymaking and implementation structures and practices. The TO lists supporting practices and narratives to help build a culture of RRI-based territorial governance. The proposed measures do not aim to offset existing practices but to augment and amplify institutional routines, allowing for organizational learning and optimization of internal processes and external communication channels. The section also refers to barriers for embedding RRI that have been identified by the experts taking part in the project.

By their nature, RRI and AIRR are a multi-actor (i.e., they involve many stakeholders) and multi-level processes (i.e., they concern all the hierarchical levels of the organization). Therefore, they can be “institutionalized” only by creating appropriate (permanent) administrative and communication spaces and procedures inside the organization, in this case, in the local government structures. That means also creating communication spaces and participatory mechanisms to maintain a high degree of participation as a necessary driver of change.

The RRI/AIRR approach complements research and innovation governance by helping to identify in advance some key impacts of innovation policies on society, stakeholders, and individuals. This is especially important regarding new technological breakthroughs and future-oriented innovation, where local and national governments need to carefully assess and anticipate potential outcomes, taking responsibility for decisions made. A general justification for including each of the RRI keys in the policy area is given below; specific RRI-related measures are included in the policy sections that follow.

- **Public engagement:** The co-creation model implies a direct, active, and ongoing involvement of citizens and stakeholders in the governance of the R&I process. The extent of engagement can vary ranging from public surveys and information gathering to that which involves people directly in the research and innovation processes.

In designing public engagement measures the local government needs to consider the cultural specifics and traditions for political participation in the city. Public engagement ensures informed decision-making and a higher level of transparency and accountability of local governance; shared ownership of solutions and responsibility for the living environment that we all create. Regarding the research and innovation community, public engagement implies a higher level of responsiveness to societal challenges.

- **Ethics/integrity of governance.** This RRI key is included in each policy area as it ensures that research and innovation are conducted in ethically appropriate ways, considering the needs of vulnerable groups and current and future generations.



- **Open access:** In a transparent innovation governance, open access and the sharing of results play a key role. Through open access to data, general knowledge can be increased and decisions around research and innovation can be improved; effectiveness and appropriateness of innovation is enhanced; the overall quality of research through data sharing is improved.
- **Gender equality:** This key ensures that appropriate frameworks are in place to support people in the workforce including women; it helps foster recognition of the role that different genders can play in all aspects of research and innovation. Gender equality and diversity encourage the formulation of research methodologies that are gender neutral or take account of gender specific issues. Gender-inclusive policies enhance the ability to address imbalances in research investment and prioritization, having in mind local needs.

POLICY OBJECTIVES FOR AREA SUPPORT FOR INNOVATION

Objective 1: Sofia launches large-scale mission-oriented research and innovation projects as a contribution to the socio-ecological transformation.

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 1:	Sofia launches large-scale mission-oriented research and innovation projects as a contribution to the socio-ecological transformation of the city.	
Action 1.1	Establish a unit in Sofia Municipality to coordinate the collaboration with academia, business associations and NGOs in defining the objectives and impact pathways of innovation-driven city policies.	2025
Action 1.2	Revise the Innovation Strategy for Smart Specialization of Sofia, to support innovation planning and governance at local level	2027
Action 1.3	Build horizontal communication links with stakeholders from research and academia, the private and civic sectors to support open innovation policies.	2024
Action 1.4	Apply the living labs approach to experiment and scale out/up innovations (social, technological) throughout the city.	2025
Action 1.5	Prioritize local business/technology sectors for funding (through Municipal Guarantee Fund, InvestSofia, etc.) to achieve policy objectives.	2026
Action 1.6	Identify new fundraising opportunities from local and global sources, individual donors, EU funds to support the projects.	2026

Elaboration and Justification

This objective is in line with the city’s overall ambition to brand itself as smart, green, connected, innovative, data-driven metropolis. It responds to EU priorities linked to the achievement of the objectives set forth in the Green Deal and Digital Agenda for Europe. Mission-oriented and challenge-based policymaking is linked



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101006439

to achieving desired societal impacts for large social groups. The policy objective has a cross-cutting character as it applies to the overall governance of the research and innovation system. No specific barriers to implementation are identified.

Relation to ongoing policy processes/strategies

The objective is in line with strategic goals and operational objectives set in the current Integrated Urban Plan for Development 2027, as well as in sectoral policy documents such as the IS3 and the Digital Transformation Strategy for Sofia. It is also aligned with national strategies, such as the National Development Program 2030 and The program Competitiveness and Innovation in Enterprises 2021-2027 contributes to the achievement of two Policy Objectives set at European level: Policy Objective 1 “A smarter Europe by promoting an innovative and smarter economic transition” and Policy Objective 2 “A greener, lower-carbon Europe by promoting clean and equitable energy transition, green and blue investments, circular economy, adaptation to climate change and prevention and risk management”.

RRI-AIRR Framework

The rationale for including the specific measures is given above.

RRI RELATED MEASURES	
Public engagement	Appoint an officer to plan and maintain R&I community engagement across municipal programs through face-to-face events and in social media platforms.
Open access	Research and innovation projects funded by the municipality shall be required to follow open access policies and make their results available to third parties.
Gender equality and diversity (GED)	To support mainstreaming of gender equality and diversity, the municipality shall require all partner organizations (subcontractors, service providers, research organizations, etc.) to adopt institutional gender and diversity plans.
Ethics	Establish a municipal ethics review board for evaluating research proposals, procurement bids, programming documents, funding instruments to ensure that they are fair, gender-balanced and inclusive.
Science education	Promoting the innovative achievements by research institutes, universities, businesses through the media, dedicated public events, to facilitate the adoption of ideas and outputs in territorial governance and the provision of public services.
Anticipation	Run annual foresight events (forward-looking activities) to select ideas for living labs experimentation and scaling (Action 1.2)
Inclusiveness	Social inclusiveness can be ensured by including underrepresented individuals and groups in research, entrepreneurship and innovation activities. The policy can either build innovation capabilities of disadvantaged groups or facilitate their access to opportunities to participate in innovative activities.



Reflexivity	<ul style="list-style-type: none"> Establish and maintain internal mechanisms to regularly review and revise all policy documents to include measures for inclusion and engagement of vulnerable groups. Develop series of opportunities for mutual learning between policymakers, practitioners, and the research community, based on research outputs and implemented through innovative methodologies and practices.
Responsiveness	Include policy, businesses, and NGOs on program advisory boards, in particular for scoping of funding programs and calls (Action 1.1, 1.2)

Objective 2: Build and brand Sofia as an attractive location for top international researchers and research & innovation units of international corporations.

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 2:	Build and brand Sofia as an attractive location for top international researchers and research & innovation units of international corporations.	
Action 2.1	Establish a unit in Sofia Municipality to coordinate multi-annual research and innovation programs with the R&I community.	2025
Action 2.2	Identify new fundraising opportunities from local and global sources, grants and donations, sponsorships, EU funds to support the implementation of research and innovation projects.	2025
Action 2.3	Strengthening networking and collaboration with international research and innovation hubs through EU-funded networks and programs, to align local R&I priorities with EU-level initiatives.	2026
Action 2.4	Build strategic partnerships with European research and innovation and technology centres to support the recruitment, retention and development of key research staff of local innovation hubs/centers.	2025

Elaboration and Justification

The objective is linked to the priorities set in the IS3 to transform Sofia into a hub for innovative technology development. In addition, Sofia is part of large network of centers of competence for social innovations which will be offering both methodological and financial support to social entrepreneurs. SDA is a co-founder of the national contact point for the Employment and Social Innovations program of the European Social Fund.

Relation to ongoing policy processes/strategies

Sofia is home to digital knowledge and technology centers such as INSAIT, Tech Park and others, and this objective supports the city’s efforts to be a talent magnet, esp. for the ICT industry. Being the capital city with the highest concentration of universities, IT sector businesses, highest share of FDIs, etc., the city should strive to lead the innovation process also by sharing experience with and opening its innovation ecosystem to other cities in the country. Currently, Sofia Municipality is implementing an Interreg Europe-funded project



on promoting a territorial skills plan for young people, in collaboration with international partners and the Bulgarian Academy of Sciences.

RRI-AIRR Framework

The following measures are proposed, in alignment with the rationale provided above.

RRI RELATED MEASURES	
Public engagement	Appoint an R&I officer to support cross-sector stakeholder contacts and collaborations, through workshops, dedicated communication channels, events, building alliances for innovation, etc.
Open access	Provide open access to research results for start-ups and innovation companies to develop digital/social/green innovations; prioritize innovations that address challenges/problems in the municipality.
Gender equality and diversity	Require gender equality & diversity plans from local R&I stakeholder organizations.
Ethics	Establish ethics review boards to assess research applications/proposals for funding; integrate ethics requirements in the recruitment and selection procedures of funding programs.
Science education	Invite quadruple helix stakeholders to regular consultations for input to policy objective.

Objective 3: Innovative municipal administration: Build governance and administrative capacity for implementing public sector innovations to make Sofia a smart city.

OBJECTIVE AND ACTIONS	TIME FRAME
OBJECTIVE 3: Innovative municipal administration: Build governance and administrative capacity for implementing public sector innovations by 2030, to make Sofia a smart city	
Action 3.1 Pilot innovations in specific sectors and municipal units through small-scale interventions, which are then scaled up.	2025
Action 3.2 Develop and implement Flagship projects for innovations in the public administration.	2025
Action 3.3 Establish a Public Sector Innovations Lab (PSIL) to support public sector innovations in cooperation with QH stakeholders.	2025

Elaboration and Justification

Building the capacity of the municipal administration is one of the strategic priorities that has been emphasized by all the experts involved in the analytical and co-creation activities. A strong demand for smarter, digitally savvy administration, capable of coordinating complex transition processes at speed and scale, but



also with responsiveness and care for all those affected is voiced in response to an enhanced need for consensus building in the context of deep societal transitions. This trend is visible in all four policy areas. Public sector innovations are still lagging; *intrapreneurship* is a possible pathway of boosting capacity and pooling resources to achieve the objective.

Relation to ongoing policy processes/strategies

The municipality is a partner in EU-funded initiatives (Horizon Europe projects), which aim to improve policymaking and innovative public service design, for instance, through building a digital twin of the city or drawing up data collection, storage, and management policies (e.g., *PolicyCloud*). A public sector lab will speed up and streamline the process of identifying innovations to be tested and scaled up at city level.

RRI-AIRR Framework

The following measures are proposed, in alignment with the rationale provided above.

RRI RELATED MEASURES	
Public engagement	Run annual open competitions in which citizens select public sector initiatives to be implemented [based on the model of the annual initiative <i>Sofia Chooses</i>]
Open access	<ul style="list-style-type: none"> • Introduction of open access to data and information for administrative operations and public service delivery. • Citizens monitoring and control of the implementation of open data policies.
Gender equality and diversity [GED]	Innovations to be implemented should undergo a gender equality and diversity assessment; ensure administrative units have diversity and gender equality policies with mandatory training for municipal staff, compliance checks and mechanisms for reporting GED violations.
Ethics	Establish a municipal ethics review board for evaluating research proposals, R&I programming documents, funding instruments to ensure that they are fair, gender-balanced and inclusive.
Science education	Attracting experts from other fields to management positions in Sofia Municipality to aid the coordination of the PSI Lab.
Anticipation	Run annual foresight events with experts from R&I ecosystem to define innovation priorities; participation in initiative such as City Science Initiative, Intelligent Cities, 100 Climate Neutral and Smart Cities, etc.
Inclusiveness	Building/expanding expert communities for PSI through stakeholder collaboration; systematic evaluation of the innovations for their potential to eliminate structural discrimination based on gender, social and ethnic background, age or sexual orientation.
Reflexivity	Conduct regular reviews of policy and action plans to ensure alignment with EU priorities and funding opportunities; annual publications and visualization of data on project implementation.



Responsiveness	Undertake internal reorganisations to strengthen horizontal communications and bottom-up initiatives within municipality.
----------------	---

Introduction to Policy Area: DIGITAL TRANSITION AND NEW SKILLS

Sofia Municipality adopted its first digital transition strategy in 2020. The *Digital Transformation Strategy for Sofia* (DTSS)¹³ is the result of Sofia's participation in the Digital Cities Challenge (2018-2019), an initiative of the European Commission (EC) that aims to help cities in the EU achieve sustainable economic growth through the introduction and use of high technology in all aspects of public life. In January 2020, the municipal council voted the creation of a new department for Digitalization, Innovation and Economic Development - [InnovativeSofia](#), headed by a Deputy Mayor, which is tasked with the management, implementation and monitoring of the DTSS.

The strategy envisions Sofia as a fast-growing economy based on the use of advanced technology in all areas of public and economic life. Sofia is set to become an “innovative, intelligent, modern, progressive and high-tech city, an attractive center and a preferred place for living, business and R&D.” To achieve this goal, the city will actively develop solutions together with quintuple stakeholders at local, national, and international levels. DTSS complements and further expands on the goals for digitalization set forth by the *Innovation Strategy for Smart Specialization of Sofia* (IS3). An action plan, which is part of DTSS, lists a series of measures to strengthen the ICT business ecosystem in Sofia. The priorities outlined in the DTSS are:

- Digital-based solutions for improving local services;
- Open data platforms;
- Development of new and optimization of already existing e-services to provide citizens and businesses with secure, intuitive and easily accessible experience;
- Digital-based solutions for improving accessibility and inclusion;
- Co-creation and implementation of new digital platforms, tools, and solutions in different sectors to facilitate inclusivity and sustainable urban development;
- Digital-based solutions for the administration.

Important challenges relate to improving the digital skills of the administration and the citizens through re-skilling and upskilling programs for all ages. Digital technologies clearly impact on the administration’s ability to respond and adapt to changing societal needs. In terms of open access to data, an existing barrier is the lack of compatibility and verification mechanisms for standardizing data collected. In principle, the current hierarchical model of governance and decision-making is an obstacle to a more effective communication and cooperation between the municipality and stakeholders. Regarding the process of responsive reflexive governance, centralised communication and decision-making prevent the promotion of bottom-up initiatives for change. Specific focus should be placed on ensuring that public e-services are adapted to meet the needs of people with disabilities in line with EU directives.

¹³ <https://innovativesofia.bg/en/strategies-and-policies/>



Ongoing projects linked to DTSS include a distributed platform of urban data - creating a Data Lake – a storage repository that holds a vast amount of raw data in its native format, including structured, semi-structured, and unstructured data. The data lake will not only be used to store data from and for the municipality but also business, citizens, academia. Sofia's Digital twin (a cyber-physical platform for decision-making optimization) is a digital profile of the physical city that helps to optimize its performance and can be used as a platform for planning and decision making but also experimentation and research. The overall goal is to help decision-makers and experts to better plan and implement urban interventions. The DTSS action plan foresees the creation of a digital and physical space for start-ups in Sofia and development of new or customization of an existing e-platform for start-ups and scale-ups. This space will promote entrepreneurial initiatives and innovative thinking among young people, facilitating the connection between start-ups and investors. A key project that helps implement the DTSS are the [Sofia Sandbox for Innovative Solutions](#), supporting small grants of local start-ups.

Recently, Sofia has joined [The Cities Coalition for Digital Rights](#), launched by the Cities of Amsterdam, Barcelona and New York in November 2018. The Coalition is committed to promoting and defending digital rights in urban context through city action, to resolve common digital challenges and work towards legal, ethical and operational frameworks to advance human rights in digital environments.

Synthesis of Findings

The main conclusions drawn from the RRI-LEADERS territorial audit report and input from experts indicate that digitalization of administrative procedures, e-government and public e-services should be on top of the local government's agenda in digital policy. The city should build upon the momentum created by the COVID-19 pandemic which forced public institutions, private companies as well as citizens to turn to digital tools for communication and work. The infrastructure for e-government exists at national and local level and these facilities need to be integrated to ensure adequate, secure, and accessible public services to the citizens. In this regard, a recurrent solution to the digital transition has been building a platform for data exchange / open data accessible to public and private companies.

From the viewpoint of the RRI/AIRR framework, DTSS identifies public engagement as an essential part of its implementation; information exchange and communication; participation, collaboration, (co)-production; participatory decision-making; and open governance are described in the document as methods of public engagement and inclusiveness. Open data, access to data, open-source software are listed as prerequisites for the implementation of the DTSS. In terms of science education, specific objectives are set to encourage university education in STEM, informatics, as well as entrepreneurship. However, no considerations of ethics and ethical issues linked to digital transition are mentioned; ethical issues (related to the use of AI, public e-services, etc.) are critical for a just digital transition and should provide an overarching framework for broad stakeholder engagement. City inhabitants and businesses need to be part of the digitalization of public services to reduce the digital divide of communities marginalized by the transition to an increasingly dominated by technology working and living environment.

The experts consulted in the project agree that a strong city leadership is needed to move forward with digitalization processes by consolidating the technical infrastructure and resources in the entire administrative system. Further efforts are needed to strengthen the role of Sofia Municipality as end user/client of local ICT, R&I companies, fostering product experimentation and development of digital products and solutions for the public sector. Developing smart data platforms / digital twins of integrated public service systems to



facilitate large-scale socio-technical transitions, e.g., green transition, just energy transition, low-carbon economy transition, is seen as essential for how the future policy making and strategic programming process is organized at city level.

Some of the solutions to the challenges proposed in the Delphi study included the introduction of e-services for the inhabitants and businesses in Sofia, creating open data platforms and support for smart city interventions. A second field of ideas refers to the inclusion of young people, NGOs and start-ups in the process of training/reskilling/upskilling of people from various ages to adapt to the new digital services. Promoting business models and public-private partnerships that can facilitate a just digital transition esp. for vulnerable groups is an important recommendation derived from the Delphi study.

Against that background, the core ambition of the TO for the policy area Digital Transition and New Skills is to anticipate and to explore possibilities to advance and accelerate desired transitions, contribute to the understanding of drivers, dynamics and implications of major changes in the research, innovation, and socio-technical systems in the city and how this may contribute to public policy goals like sustainability, including also justice and equitable societal development.

Summary of recommendations regarding the inclusion of RRI and AIRR in the policy area Digital Transition and New Skills

1. Include gender dimensions/gender equality linked to digital transition, transformative technologies, digitalization.
2. Emphasize considerations of ethics, including research ethics and ethical issues linked to digital transition; they should provide an overarching framework for broad stakeholder engagement in the development and implementation of the strategy.
3. More detailed measures related to AIRR such as anticipatory governance, inclusiveness should be included.
4. Building administrative capacity for foresight and scenario development using big data analytics, to address the challenges and expected impact of transformative technologies. Overall, the governance of digital transition processes and the uptake of research in policy and programming need to run parallel. Enhancing the administrative capacity to support research which is timely and to take account of 'state of the art' technologies, management or service frameworks could significantly improve the effectiveness of innovation governance and ensure that the innovations with the highest social benefit are adopted.

Synthesis of Findings from Citizen Review Panels in Sofia Municipality

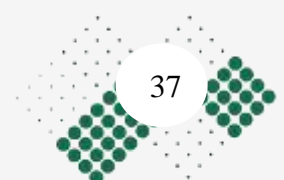
Conclusions from the CRP largely confirm the findings obtained in the preceding mapping and co-creation sessions. Strong support was voiced for digitalization of the administrative services to increase transparency and prevent corruption; similarly, using digital platforms to improve public transport, waste management and other communal services was strongly encouraged. Citizens insisted on introducing robust data protection policies and enforcing them according to the law. The proposals were included in the final formulation of the policy actions.

RRI-AIRR FRAMEWORK

Rationale for including the individual RRI keys in policy area Digital Transition and New Skills



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439



The RRI-related measures for the policy area are linked to improving communication and data exchange processes within the administration; stakeholder relations and user engagement; and capacity of anticipatory and inclusive policy implementation.

Public engagement is a critical component as it concerns measures for reducing the digital divide and ensuring equal access of all to digital tools and technologies of the future. Engagement ranges from information gathering and communication with city residents to participatory and collaborative/co-creation methods of designing policy measures; and governance based on **open data**. Key stakeholders relevant to the domains of the DTSS are representatives of the start-up and innovation ecosystem through an advisory board and/or working groups coordinated by the Digitalisation, Innovation and Economic Development department (Innovative Sofia) of the municipality.

Science education is a second important RRI element linked to DTSS. More specifically, it aims to ensure adequate and equal opportunities to formal and informal lifelong learning in the fields of science, technology, engineering and mathematics (STEM), interdisciplinary engineering and informatics, necessary to prepare a skilled workforce for the digital age. Science education helps increase the competence of those engaged in research and innovation, and their ability to deliver in relation to knowledge and commercial outcomes. Researchers aware of technological achievements are better capable of communicating them to policy- and decisionmakers, as well as to the public, to facilitate the adoption of various technological products and services. In many documents of the European Commission concerning the research and development of AI technologies¹⁴ emphasis is increasingly placed on the role of informed consent, education, and public awareness of the benefits and pitfalls of AI. The public must be educated on the use, misuse, and potential harms of AI, via civic participation, communication, and dialogue with the public. Debate on the applications of AI in governance and public services is currently missing in society.

Open data, access to data and open-source software have been consistently identified by experts as necessary prerequisites for achieving the objectives of DTSS. Open access means wider access to research outcomes and to knowledge about related innovations, providing opportunities for individuals and businesses to develop alternative competing solutions, and ensuring transparency in the making and use of digital technologies. 'Design for All' approaches to technologies can help all people through simple, accessible and usable interfaces and controls.

Provisions related to **Research ethics** and ethical (self)-assessment of digital transition processes, products and services are of utmost importance. On the one hand, such provisions will promote a higher level of accountability for those engaged in research and innovation that can be inclusive of different interest groups. A recent proposal by the European Parliament puts heavy emphasis on RRI as a way to ensure ethical sensitivity in future AI research, development and deployment. The [European Parliament](#) suggests that “the potential of artificial intelligence, robotics and related technologies ... should be maximized and explored through responsible research and innovation”. The EU report “The Ethics of AI: Issues and Initiatives” deals with the ethical implications and moral questions that arise from the development and implementation of AI

¹⁴ For example, initiatives like the [EC White paper on AI](#), the EU’s [High-level Expert Group on AI](#), [AI Alliance Platform](#), the EC [AI Watch](#), etc.



technologies. According to the report, “AI ethics is concerned with the important question of *how human developers, manufacturers and operators should behave* in order to minimise the ethical harms that can arise from AI in society, either arising from poor (unethical) design, inappropriate application or misuse (italics added).”¹⁵

Gender equality and inclusive governance helps ensure that risks of digital exclusion based on age and gender are anticipated and mitigated, and research aims for societal benefit. Including gender and diversity considerations in measures for digital transition is a critical step for ensuring that technological transformations meet the needs of those concerned and minimize the unintended outcomes (e.g., risks of unemployment, no access to digital devices, to internet, public service), etc.

AIRR principles reflected in the DTSS

To ensure wide stakeholder **engagement, inclusiveness, responsive and accountable governance**, a special advisory council to the Deputy Mayor for Digitalisation, Innovation and Economic Development was established, the so-called *Digital Board*. DTSS states that user engagement, implementation of participatory models of governance, creation of collaborative ecosystems, and optimisation of user behavior are the real objectives of technologies, open data management and digital transition in Sofia Municipality.

POLICY OBJECTIVES FOR DIGITAL TRANSITION AND NEW SKILLS

Objective 1: Improve the technical infrastructure and connectivity in Sofia Municipality through smart, environmentally friendly, user-friendly, and cost-effective solutions by 2025

OBJECTIVE AND ACTIONS	TIME FRAME
OBJECTIVE 1: Improve the technical infrastructure and connectivity in Sofia Municipality through smart, environmentally friendly, user-friendly, and cost-effective solutions by 2025	
Action 1.1 Ensure active collaboration and support to joint projects with the IT sector and private companies to design technical solutions.	2025
Action 1.2 Increase the capacity and digital competencies of the administration; train and retain local talent (within the administration).	2025
Action 1.3 Participation in pan-European initiatives and applying to EU programs to build state-of-the-art infrastructure.	2024
Action 1.4 Maintain and expand the zones with free Wi-Fi access in the city.	2025

Elaboration and Justification

¹⁵ *The Ethics of AI*, p. 2 ff., [https://www.europarl.europa.eu/ReData/etudes/STUD/2020/634452/EPRS_STU\(2020\)634452_EN.pdf](https://www.europarl.europa.eu/ReData/etudes/STUD/2020/634452/EPRS_STU(2020)634452_EN.pdf)



The objective is in line with the priorities of DTSS to build Sofia as connected, smart, data-driven city. It considers the important role of the ICT sector for the city economy, for which an enabling factor is also the high internet speed available across the city sections.

Relation to ongoing policy processes/strategies

The implementation of the objective is in line with other objectives of DTSS and will not face additional barriers or challenges. Both DTSS and this objective fit well with the priorities for digital transition of the EU. Ongoing initiatives such as Horizon Europe funded projects can help implement RRI-related measures, drawing from EU best practices. Synergies with initiatives planned in the national strategy Digital Transformation of Bulgaria for the period 2020-2030¹⁶ are a good opportunity to align local priorities with those at national level.

RRI-AIRR Framework

The rationale for including the specific measures is given above.

RRI RELATED MEASURES	
Public engagement	Develop an annual communication and public engagement plan for the municipality, including the organization competitions for start-ups to develop innovative solutions, pilot projects commissioned by the municipality, etc.
Open access	The municipal directorate responsible for digital transition, InnovativeSofia, should draw up an open access regulation, facilitating third-party access to data and development of technology solutions.
Gender equality and diversity	<ul style="list-style-type: none"> Establish a gender and diversity board to assess all digital transition projects; regular consultations with gender and equality experts to ensure the proposed technical solutions are free of systemic bias and any form of discrimination. Develop guidelines for the municipal administration and subcontractors on building gender-neutral tech systems.
Ethics	Appoint an ethics board to assess all technological solutions to ensure they meet ethical standards. Since Sofia is part of the initiative The Cities Coalition for Digital Rights , use that expertise to develop ethics guidelines for the municipal staff and stakeholders.
Science education	Include in the annual communications and public engagement plan specific measures for researchers and innovators to share the results of their work to both citizens and decision-makers.

Objective 2: Provide an accessible, affordable and inclusive digital environment for vulnerable groups through new social e-services by 2025

¹⁶ https://www.mtc.government.bg/sites/default/files/digital_transformation_of_bulgaria_for_the_period_2020-2030_f.pdf



OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 2:	Provide an accessible, affordable, and inclusive digital environment for vulnerable groups through new social e-services by 2025	
Action 2.1	Conduct biannual needs assessment to identify gaps and opportunities for e-service provision to the target groups, with their involvement.	2025
Action 2.2	Introduce financial instruments to support the development of technological solutions in partnership with the local IT sector and target groups.	2025
Action 2.3	Provide information, training, and access to digital devices and digital services to the target groups.	2024

Elaboration and Justification

The policy objective is in line with the priorities of DTSS to build Sofia as connected, smart, data-driven city. It considers the growing digitalization of public services and everyday operations and the fact that many city inhabitants have no access to internet or to digital devices. According to DESI 2020, in terms of human capital, the level of digital skills of Bulgarian citizens is among the lowest in the EU. Citizens with basic digital skills make up only 29% of the country's adult population, compared to the EU average of 58%. When it comes to internet usage, Bulgaria ranks 27th, with the overall score well below the EU average. Around 67% of Bulgarians use the Internet (the EU average is 85%), while 24% have never used it which is the highest percentage among all member states.

Relation to ongoing policy processes/strategies

The implementation of the objective is in line with other objectives of DTSS and will not face additional barriers or challenges. Both DTSS and this objective fit well with the priorities of the National Program "Digital Bulgaria 2025" and Roadmap for its implementation, as well as with the Digital Agenda for EU.

RRI-AIRR Framework

The rationale for including the specific measures is given above.

RRI RELATED MEASURES	
Public engagement	<ul style="list-style-type: none"> Developing an annual public engagement plan, involving the target groups in finding solutions and their implementation. Increase the use of online consultation platform which allows individuals and stakeholders to participate in public consultations.
Open access	The municipal directorate responsible for digital transition should draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.



Gender equality and diversity	<ul style="list-style-type: none"> Establish a gender and diversity board to assess all digital transition projects; regular consultations with gender and equality experts to ensure the proposed technical solutions are free of systemic bias and any form of discrimination. Promote provisions concerning senior citizens' access to digital services.
Ethics	<ul style="list-style-type: none"> Appoint an ethics board to assess all technological solutions to ensure they meet ethical standards. Since Sofia is part of the initiative The Cities Coalition for Digital Rights use that expertise to develop ethics guidelines for the municipal staff and stakeholders. Regular monitoring of the implementation of the policy to ensure ethics standards, digital rights and security regulations are embedded in the digital solutions.
Science education	Provide in-person and online training to the target groups on using digital services.

Objective 3: Sofia adopts regulatory framework with standards for digital rights, data security, transparency, and trustworthy technological solutions, applicable to research, innovation and business stakeholders and IT entrepreneurs.

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 3:	Sofia adopts regulatory framework with standards for digital rights, data security, transparency, and trustworthy technological solutions, applicable to research, innovation and business stakeholders and IT entrepreneurs.	
Action 3.1	Adopt a new open data policy to optimize the dissemination of information to the public as well as the internal communication within the administration by 2025	2025
Action 3.2	Develop a framework with applicable standards for the administration, research, business and civil society stakeholders (opportunity to include RRI keys).	2025
Action 3.3	Appoint a municipal officer responsible for digital rights and digital citizenship issues to serve as liaison to business and research community.	2025
Action 3.4	Digitalisation of administrative processes and services. Establishment of a virtual office, general information desk of Sofia Municipality.	2026

Elaboration and Justification

The objective is in line with the priorities of DTSS to build Sofia as connected, smart, data-driven city. It considers the important role of the ICT sector for the city economy, for which an enabling factor is also the high internet speed available across the city sections.

Relation to ongoing policy processes/strategies



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439

The implementation of the objective is in line with other objectives of DTSS and will not face additional barriers or challenges. Both DTSS and this objective fit well with the priorities for digital transition of the EU.

RRI-AIRR Framework

The rationale for including the specific measures is given above.

RRI RELATED MEASURES	
Public engagement	<ul style="list-style-type: none"> Initiate a public consultation process on the regulatory framework to discuss the scope and implementation of digital rights; engage with research and business institutions for standardisation and mechanisms to ensure transparency, security and data privacy. Organize communication events to inform the public about digital rights and implications for accessing public e-services and digital infrastructure.
Open access	<ul style="list-style-type: none"> The municipal directorate responsible for digital transition to draw up an open access regulation, facilitating third-party access to data and development of e-service solutions, observing the standards of the new regulatory framework. Conduct regular review of the ethics of data capture and data sharing.
Gender equality and diversity	Establish a gender and diversity board to assess all digital transition projects; run consultations with gender and equality experts to ensure the proposed framework and technical solutions are free of systemic bias and any form of discrimination; include provisions for monitoring the exercise of digital rights, complaint and redress procedures.
Ethics	<ul style="list-style-type: none"> Appoint an ethics board to consult the preparation and implementation of the regulatory framework; regularly assess the implementation. Organize expert and public discussions on ethical standards and their integration in digital applications, including on AI and its use in public e-services and communications.
Science education	Organize public information campaigns on digital rights, data security, transparency and trustworthy technological solutions (including AI); develop easy-to-understand information materials for vulnerable groups.

Objective 4: Together with **the local business sector**, the educational sector and research institutions, Sofia develops framework conditions that ensure the availability of highly skilled workers for the digital industry.

OBJECTIVE AND ACTIONS	TIME FRAME
OBJECTIVE 4	Together with the local business sector, the educational sector and research institutions, Sofia develops framework conditions that ensure the availability of highly skilled workers for the digital industry.



Action 4.1	Update DTSS to define a plan for continuous upskilling and reskilling of municipal staff.	2024
Action 4.2	In collaboration with local universities and the business, develop joint programs to transform local students and workforce into digital talent.	2025
Action 4.3	Design and implement an up-skilling program for micro businesses and SMEs to take advantage of opportunities that emerge because of digital developments.	2025

Elaboration and Justification

The objective is in line with the priorities of DTSS to build Sofia as connected, smart, data-driven city. It considers the important role of the ICT sector for the city economy, for which an enabling factor is also the high internet speed available across the city sections.

Relation to ongoing policy processes/strategies

The implementation of the objective is in line with other objectives of DTSS and will not face additional barriers or challenges. Both DTSS and this objective fit well with the priorities for digital transition of the EU. The objective supports also initiatives implemented by InvestSofia Agency and the Municipal Guarantee Fund for SMEs.

RRI-AIRR Framework

The rationale for including the specific measures is given above.

RRI RELATED MEASURES	
Public engagement	Initiate public discussions with experts and civil society about the unprecedented opportunities for learning and training offered by digital technologies.
Open access	The municipal directorate responsible for digital transition should draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	Establish a gender and diversity board to assess all digital transition projects; run consultations with gender and equality experts to ensure digital education and employment frameworks are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.
Ethics	Appoint an ethics board to consult the preparation and implementation of the regulatory framework; regular assessment of the framework implementation to ensure ethical standards and digital rights are observed.
Science education	Organize event series for citizens and civil society to discuss different types of new/emerging digital technologies and ways that they can be used for skilling and up-skilling.



Introduction to Policy Area: YOUTH EMPLOYMENT AND ENTREPRENEURSHIP

The main document in this policy area is the *Sofia Youth Strategy 2017-2027* (SYS).¹⁷ According to the strategy, Sofia plans to grow into a “city of the young, the active and the innovative.” The strategy vision focuses on equipping young people with skills and competences for lifelong learning, prosperity and autonomy, and active participation in the public decision-making process. Given that Sofia is home to almost half of the universities in the country (23 out of 52) and many young people come to the city to study, the strategy supports youth organizations, youth services and youth workers, by connecting them with educators and employers and by creating various programs for young people.

The city has a huge potential to develop as a centre of the IT sector, the gaming industry, and the creative and cultural industries. Young people engaged in these sectors are an important source of knowledge and expertise. There is also potential to engage young people in open innovation and experimentation linked to societal challenges. For example, the city itself could become a testbed for various solutions to key public systems (public transport, healthcare, etc.) The support of civic entrepreneurs requires the creation of dedicated spaces and processes whereby different players can collaborate to define and experiment with innovative ideas (e.g., SofiaLab, an urban living lab). Other strategic priorities include the creation of favorable conditions for professional, social, and personal realization of young people, their participation in socio-economic life, and involvement in public governance. A further priority is promoting active and healthy lifestyles of young people.

Therefore, the overarching priority in this policy area is the introduction of new opportunities for education and entrepreneurship in the municipality through better networking among stakeholders. To achieve the objective, young people need to be involved in advisory and consultative bodies at the municipality to facilitate regular input and feedback on youth-related policies and measures. Further support to the innovation ecosystem should be provided through programs for start-ups, tech, and social entrepreneurs.

The critical challenges in this area deal with the ageing population of the city, continuing brain drain and lack of efficient measures to retain young talent in the city (through financial, human resources, and other incentives).

Synthesis of Findings

As evidenced by the analysis of the *Sofia Youth Strategy* (SYS), the document reflects most of the principles of the RRI-AIRR framework – in the strategy development, implementation, monitoring, and evaluation.

¹⁷ *Sofia Youth Strategy 2017-2027*. https://www.sofia.bg/documents/20182/448750/Strategy_young_people-SO-2017-2027.pdf/8186ee54-8135-42e0-bfa2-17dd2b281742 (in Bulgarian)



These include civic participation through a broad consultation process; the objectives set in the Strategy support access to open data, inclusiveness, and engagement. As concerns the AIRR dimensions, the Strategy supports the inclusion of young people in policy- and decision-making. The annual assessment and monitoring are examples of reflexive and accountable governance; an annual report is submitted to the respective directorate in the municipality.

A potential driver for change could be collaboration with all stakeholders – schools, businesses, universities, to define a framework of future skills needed for the local economy. In this process, the leading role lies within the municipality. Given the experience with the Youth Advisory Council, working with the municipality for the implementation of the Youth Strategy, this could be a strategic objective set for the next 3–5-year period (until 2027).

When it comes to public engagement and inclusion, there is need for more dialogue between public bodies, the private sector and youth organizations; more efforts are needed to give voice to all citizens, to underrepresented groups and young people with special needs. With respect to self-reflection/self-assessment in policy implementation, the *build-measure-change* cycle or design thinking (*creating, testing, piloting*) is yet to become a leading aspect in the administration's work. This is a process of ongoing adjustment of organizational structures and practices, not yet adopted by the city.

These proposals can be implemented as part of the annual plans, developed, and carried out in cooperation with the Youth Advisory Council of the municipality. In addition, specific priorities can be included in the annual calls for proposals to be funded by the municipal funding programs. Some of these priorities include: a) establishing new or improving existing programs for entrepreneurship, through mentoring and expert support from the business; b) regular reviews and forecasts about labor market needs in light of the green, digital, energy transitions; c) creating opportunities for people with migrant background to study, work and start their own business in the city; d) new measures in municipal youth policies that account for gender dimensions of employment and skills in a digital environment

Major recommendations for the Transformative outlook

1. The main recommendation concerns the introduction of gender equality measures in the strategy. This is so far missing from the document. Secondly, new priorities in line with the national and EU-level strategies until and beyond 2027 are to be formulated (e.g., EU Green Deal, EU Youth Strategy 2019-27, Digital Education Action Plan 2021-27) to support young entrepreneurs.
2. Transforming the city into an open learning environment and encourage student-led experimentation through living labs and co-creation formats. Students as representatives of future generations not only change city life, but they also have a deep impact on research and innovation. The participation of students and young people in the urban research ecology is fundamental for preparing the city and the next generation for the changes they will face.
3. Developing flexible programs with academia & business to recognize skills and competencies acquired from informal/non-formal learning, to retain local talent.



Synthesis of Findings from Citizen Review Panels in Sofia Municipality

A key recommendation from the CRP included the organization of annual The Future of Sofia conferences, built on the model of the European initiative. The deliberative event should allow young people in the city to voice their vision for the future of the city and find their role in building that future through various initiatives for education and employment.

POLICY OBJECTIVES FOR DIGITAL TRANSITION AND NEW SKILLS

Objective 1: The higher education system is able to impart strong basic skills as the foundation for teaching work-relevant capabilities at all qualification levels to benefit city areas of economic leadership by 2030

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 1:	The higher education system can impart strong basic skills as the foundation for teaching work-relevant capabilities at all qualification levels to benefit city areas of economic leadership by 2030.	
Action 1.1	Strengthen the collaboration with research institutes, businesses and municipal enterprises for innovative entrepreneurship education and youth employment.	2025
Action 1.2	Develop and test smart solutions to urban problems in co-operation with universities and research institutions in Sofia.	2026
Action 1.3	Improve the R&I ecosystem governance to support young innovators and start-ups in the city.	2026

Elaboration and Justification

This policy objective is in line with the priorities of the SYS, as well as with other related strategies, such as IS3 and the digital transition strategy. It responds to the need to prepare the city's young people to tackle current and future challenges in a digital environment.

Relation to ongoing policy processes/strategies

The objective reflects the recommendations derived from the co-creation formats in RRI-LEADERS (focus groups, Delphi survey) and is aligned with the priorities stated in other municipal policies (for smart specialization, digital transition, education). The proposals for the SYS are also aligned with the Digital Transformation Strategy; there is potential for building synergies in the development of a new youth strategy and the city's education strategy, which also expires in 2023.

RRI-AIRR Framework



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006439

Rationale for including the individual RRI-AIRR Framework in the policy area Youth Employment and Entrepreneurship

The RRI audit has shown that in this policy area some RRI keys, for example, public engagement, open access, gender equality, are more easily recognized and followed; science education and research ethics are thought as pertaining mostly to academia and only in specific cases relatable to policy development.

Public engagement is key to policy development, implementation, and impact assessment; it is broadly understood as a type of “social contract” between institutions and citizens in terms of responsibility. The level of engagement of civil society largely depends on funding and the proactive approach of the municipality to reach out to citizens and civil society organisations. Thus, the role of Sofia Municipality is seen as supporting the process (financially or through other means) and integrating the efforts of all those involved. Therefore, some of the RRI measures proposed here aim at engaging young people and responding more adequately to the needs of youth employment and entrepreneurship.

An acute problem for Sofia and the country is the worsening demographics, the ageing population and continuing brain drain. Youth policies should therefore prioritize measures to stopping the brain drain, retaining young talent, and offering attractive opportunities for living, studying, and working in the city. An effective measure is including young people in consultative bodies and designing policy measures with their input.

RRI RELATED MEASURES	
Public engagement	<ul style="list-style-type: none"> • Develop an annual public engagement plan for the municipality. • Increase the use of online consultation platforms which allows individuals/businesses to participate in public consultations.
Open access	The municipal directorate responsible for digital transition should draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	<ul style="list-style-type: none"> • Development, implementation, evaluation of youth-related funding programs in collaboration with youth organisations to ensure fair and transparent selection. • Establish a gender and diversity board to assess all projects; run consultations with gender and equality experts to ensure education and employment frameworks are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.
Ethics	Appoint an ethics board to consult the preparation and implementation of entrepreneurship and employment programs to ensure ethical standards and digital rights are observed.
Science education	Regular surveys among young people, innovators, founders of start-ups to anticipate long-term needs and plan appropriate financial instruments.



Objective 2: Financing an innovative Start-ups Program and introducing new financial instruments for youth entrepreneurship by 2030.

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 2:	Financing an innovative Start-ups Program for SMEs and introducing new financial instruments for youth entrepreneurship by 2030.	
Action 2.1	Development of mentoring programs and providing conditions that support young entrepreneurs in testing and implementing their ideas.	2025
Action 2.2	Establish a digital and physical space for start-ups located in Sofia - development of new or customization of an existing e-platform for start-ups and scale-ups.	2025
Action 2.3	Collaboration with businesses and European programs to provide additional funding for young entrepreneurs.	2026
Action 2.4	Develop a policy for innovation and start-ups in collaboration with research units and businesses (incorporated in Sofia’s RIS3).	2025

Elaboration and Justification

This objective responds to the overall policy priority to support youth entrepreneurship in the municipality. New funding instruments will ensure more financial resources for the implementation of youth projects and enterprises.

Relation to ongoing policy processes/strategies

The objective is aligned with the strategic priorities set in the innovation and smart specialization strategy, as well as the digital transition strategy. It can be implemented along with existing funding programs of Sofia Municipality (such as Incubator for Innovations, the business incubation and acceleration programs of SofiaInvest Agency, Program Europe, programs funded by the Youth Activities Directorate, etc.).

RRI-AIRR Framework

The rationale for including the specific RRI measures is given above.

RRI RELATED MEASURES	
Public engagement	The funding programs should include horizontal priorities for open access, gender equality, ethics and public engagement.
Open access	The municipal directorate responsible for digital transition should draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.



Gender equality and diversity	Development, implementation, evaluation of the funding programs in collaboration with youth organizations.
Ethics	Appoint an ethics board to consult the preparation and implementation of the funding programs
Science education	Regular surveys among young people, innovators, founders of start-ups, etc. to identify long-term needs and plan appropriate financial instruments in collaboration with them.

Objective 3: Include gender equality and diversity measures in a revised Youth Strategy of Sofia Municipality 2025.

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 3:	Include gender equality measures in a revised Youth Strategy of Sofia Municipality by 2025.	
Action 3.1	Conducting joint consultations with youth organizations, which are active in the Advisory Council on Youth Policies at Sofia Municipality.	2024
Action 3.2	Organize forums with the participation of stakeholders (academia, civil society organizations, business, state administration) to discuss targeted measures and actions to reach the objective.	2025
Action 3.3	Carry out extensive information campaigns and provide support to organizations, working on the topic.	2025

Elaboration and justification

The objective addresses one of the shortcomings in the current youth strategy, namely, the lack of gender equality and diversity measures. Ensuring equal access to resources, education and employment opportunities to different social groups and genders is a major requirement for all municipal policies.

Relation to ongoing policy processes/strategies

Gender mainstreaming is a fundamental principle of contemporary policymaking; it promotes inclusiveness and responds to the evolving perceptions of diversity in society and the need to respect human rights.

RRI-AIRR Framework

The rationale for the specific RRI-related measures is provided above.

RRI RELATED MEASURES	
Public engagement	Public discussion about the measures and the implementation of the Youth Strategy, involvement of youth organizations in the process of reporting and evaluation of results.



Open access	Mainstream open access procedures to facilitate transparent and accountable governance of gender and diversity related activities.
Gender equality and diversity	Establish a gender and diversity board to assess all start-up proposals; run consultations with gender and equality experts to ensure the proposed financial instruments are free of systemic bias and any form of discrimination; include provisions for monitoring the implementation of the GE measures in the Youth Strategy.
Ethics	Appoint an ethics board to consult the preparation and implementation of funding programs.
Science education	Ensure that formal and non-formal STEAM education opportunities are discrimination-free and sensitive to gender dimensions and impact of research.

Objective 4: Facilitate access by young people to decision-making bodies and prepare the new generation of public leaders

OBJECTIVE AND ACTIONS		TIME FRAME
OBJECTIVE 4	Facilitate access by young people to decision-making bodies and prepare the new generation of public leaders	
Action 4.1	Promote training and work offers aimed at young people in Sofia; utilize more efficiently and advertise existing internship and volunteer programs for young people.	2025
Action 4.2	Enable young people to quickly assume their first responsibilities through mentoring programs and internships at Sofia Municipality.	2025
Action 4.3	Initiate projects through the Public Sector Innovations Lab (see policy area Support for innovation, Objective 3, Action 3.3 above) to encourage careers in the city administration for young people.	

Elaboration and justification

This objective addresses the issue of an ageing society and the need to prepare a pipeline of young people to take leadership positions in the public administration. Vertical hierarchies of duties and rigid bureaucratic structures do not make the administration an attractive place for young people, therefore additional efforts are needed to support their public sector careers. The proposed measures could accelerate the process and the recruitment of young talent.

Relation to ongoing policy processes/strategies

The objective is linked to sectoral policies and priorities which aim to build and retain young people in the country, to reverse the brain drain and to ensure that attractive career pathways are in place for the young generation.

RRI-AIRR Framework

The rationale for the specific RRI-related measures is provided above.



RRI RELATED MEASURES	
Public engagement	Developing an annual communication plan with measures to attract young talent to the municipal administration.
Open access	Support open access procedures to facilitate the formulation and implementation of transparent HR policies.
Gender equality and diversity	Establish a gender and diversity board to assess all digital transition projects; run consultations with gender and equality experts to ensure education and employment programs are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.
Ethics	Appoint an ethics board to assess all recruitment and hiring procedures to ensure they meet ethical standards.
Science education	Regular surveys among young people, innovators, founders of start-ups, etc. in order to anticipate their long-term needs and plan appropriate financial instruments in collaboration with them.

Introduction to Policy Area: SUSTAINABLE URBAN DEVELOPMENT

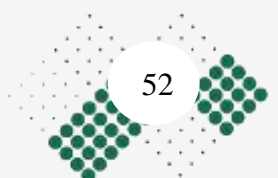
Like other big cities today, Sofia faces major economic and social challenges to urban development, including air pollution and climate change, decarbonisation, sustainable smart mobility, an ageing population, and a dynamic process of in-migration (from the inside of the country and from other countries to the capital). Over construction and urban sprawl, alongside unevenly developed urban zones and the need for regeneration of abandoned public spaces is an additional challenge for the city authorities. Due to in-migration the city's infrastructure is overexploited and housing needs are not adequately met.

The *Integrated Urban Development Plan for Sofia (Program for Sofia 2027)* underlines the importance of spatial planning and strengthening the territorial dimension of sectoral policies at local level. *Program 2027* is based on a comprehensive analysis of multiple aspects of urban development (economy, housing, public utilities and services, energy, transport, education, culture; ecology and environment). The integrated plan is elaborated in accordance with the requirements of the Regional Development Act (RDA), the Regulations for its implementation (RDPR) and the Methodological guidelines for development and implementation of integrated development plans, approved by the Ministry of Regional Development and Public Works. Three strategic goals are defined in *Program 2027* concerning urban development, as follows:

Strategic goal 1: Sustainable development and improved connectivity. The goal focuses on sustainable development, improving connectivity and the technical infrastructure.

Strategic goal 2: Increasing the competitiveness of the municipality and developing the knowledge economy. The aim is to build a competitive local economy based on innovation, increased efficiency of SMEs and sustainable growth in sectors with high added value and export potential.

Strategic goal 3: Better developed social and cultural environment. This goal supports the development of Sofia Municipality as a socially and culturally inclusive community, linking social, urban, cultural, and economic policies in a coherent system to improve the quality of life in the city in a sustainable way.



The *Program 2027* is aligned with strategic EU-level initiatives such as The City Science Initiative,¹⁸ as well as the recently launched Mission on “Climate Neutral and Smart Cities”, which highlight the importance of urban R&I and the role of the science community in the cities administrations to meet the global and European agendas in line with Horizon Europe. The Program’s overall ambition also aligns with the priorities of The New Leipzig Charter “The transformative power of cities for the common good”¹⁹ adopted in 2020, which provides a European policy framework for sustainable urban development. This is to be achieved through actions taken within the three thematic dimensions - ‘Just, Green and Productive Cities’ - as well as through one cross-sectoral dimension ‘Digitalization,’ all of which are implemented in a format of multi-level governance. The Charter enshrines the five EU principles of good urban governance that comprise “policy for the common good”, “integrated approaches”, “multi-level governance”, “place-based approaches” and “participation and co-creation”.

Synthesis of Findings

In terms of governance, the main challenges that have been identified in the RRI audits relate to the lack of efficient communication between the municipal departments; silo-thinking and inefficient policy mix; lack of reliable networked data. In terms of human resources, improving the soft skills of the administration to cooperate more effectively with academia, the industry and civil society is also identified as a need. Research results are not readily taken up by policy makers; this is due on the one hand to lack of funding for applied research and policy-related studies. On the other hand, it reflects the overall public distrust in government institutions and skepticism about their capacity to apply efficiently new knowledge and ideas.

For citizens and stakeholders, the focus in urban development should be on air pollution and improving air quality, smart public transport, and curbing urban sprawl. Citizens need to adopt responsible consumption and circular economy principles. This could be achieved by funding small pilot projects (initiated by citizens or NGOs) to tackle concrete problems in the city. Investment policies should be geared towards sustainable economic solutions and adaptation to climate change. In addition, demographic developments continue to exert pressure on various city systems (e.g., education, labor market, housing, healthcare, etc.).

The strategic priorities proposed for the policy area include a) facilitating more effective access and communication between citizens and the administration, through special contact points in each district administration; b) curbing urban sprawl and regeneration of abandoned areas, esp. in the city periphery; c) improving public transport and air quality; d) using digital tools to discuss plans for public infrastructure. The following specific priorities have been identified by project experts:

1. Building an adequate administrative system for governing the innovation process, including through improved professional capacity and skills of the administration.
2. Enabling collaborations between research, industry, and NGOs to improve community-based services and infrastructure.
3. Transforming the city into an experimentation “playground”, promoting the interaction among citizens, policymakers, researchers, and experts in-field to explore and tackle together key societal challenges.

¹⁸ <https://ec.europa.eu/jrc/communities/en/community/city-science-initiative/document/debriefing-note-and-takeaways-virtual-session-city>

¹⁹ <https://futurium.ec.europa.eu/en/urban-agenda/library/new-leipzig-charter-and-implementing-document>



4. Initiating own/support external projects in fields linked to the policy areas to take advantage of available EU funding for urban development.

Synthesis of Findings from Citizen Review Panels in Sofia Municipality

The policy area was one of the most debated during the CRP. For citizens, the political and institutional commitment of local government officials to achieve sustainable development is a key factor for change. It resonates most strongly with the specific needs of city neighborhoods and concerns related to adequate public services and an equitable resource allocation to tackle social and economic inequalities in the city. One point that was emphasized by all participants was the need for the administration to work more closely with local communities, through appointed city representatives in each of the 24 district administrations or even at the level of residential neighborhoods. In addition, citizens favored more initiatives where they can choose specific infrastructure projects to be built as well as more regular opportunities to meet with the government and discuss policy issues. Unanimously, citizens supported also annual or biannual meetings where the public institutions report on the results achieved and future planning.

Stakeholders, on the other hand, favored an approach to urban development where sustainable development principles are institutionalized as horizontal cross-cutting priorities instead of elaborating a stand-alone policy (it is not a sectoral policy *per se*). Emphasis was also placed on the need for better policy integration and synergy among municipal agencies and districts, which encourages efficient use of resources and prevents dilution of responsibility.

Stakeholders also noted the need for more systemic collaboration between municipal units for impact assessment and valorization of good practices (derived from own projects or EU-level initiatives), which are then replicated at relevant levels in the administration.

A major proposal from the stakeholders' workshop is to develop a **Roadmap for Sustainable Development of the City of Sofia**, which should integrate elements linked to sustainability from all policies and should serve as binding guidelines for the administration to follow in all long-term policy making. This proposal will be submitted for discussion during the endorsement workshop for the transformative outlook in Sofia.

POLICY OBJECTIVES FOR SUSTAINABLE URBAN DEVELOPMENT

Objective 1: Smart and sustainable urban solutions in Sofia Municipality comprise technological, organizational, and social innovations, which are developed in an integral and interdisciplinary manner across different sectors and industries and always involve the population.

OBJECTIVE AND ACTIONS	TIME FRAME
<p>OBJECTIVE 1: Smart and sustainable urban solutions in Sofia Municipality comprise technological, organizational and social innovations, which are developed in an integral and interdisciplinary manner across different sectors and industries and always involve the population.</p>	



Action 1.1	Introduce pre-commercial public procurement to support innovative solutions for municipal services.	2025
Action 1.2	Digitalize and organize administrative processes of relevance for the municipal economy as efficiently and cost-effectively as possible.	2027
Action 1.3	Develop and implement technological and social solutions for the CO ₂ -neutral urban and regional transport of passengers and goods.	2027
Action 1.4	Carry out social and economic impact assessment (besides ecological impact) of policies for sustainable urban development.	2025

Actions proposed by the CRP and stakeholder workshop:

Action 1.5	Expand the functionalities of the current web platform of Sofia Municipality callsofia.bg to include interactive communication with citizens; promote the use of the mobile app linked to the platform.
Action 1.6	Increase and enforce measures for traffic safety.
Action 1.7	Design a digital system for waste management and communication to the citizens on related issues.

Elaboration and Justification

The objective captures the vision for the purpose of innovation and the governance principles of an open, inclusive, and socially responsible R&I system. It brings together related aspects from different sector policies, focusing on the elements of public engagement, transparency, and responsibility.

Relation to ongoing policy processes/strategies

The objective sums up the priorities and the principles of implementation of the smart specialization strategy and correlates with priorities stated in the digital transformation strategy of Sofia (*see above section on digital transition and new skills*).

RRI-AIRR Framework

The process of building capacities for urban transformation includes skills, tools, organizational and personal capabilities, working methods and processes, access to experiences and verifiable knowledge.

The RRI-related measures proposed in this policy area do not significantly differ from the previous sections. One reason is that urban development encompasses the other three policies to various extents and the RRI keys suggested above are relevant also to the objectives in this policy. Sustainable urban development requires strong mobilization of the citizens as co-creators and owners of the proposed solutions, but also a higher level of consensus building among stakeholders in the context of deep societal transitions. At the same time, there is a growing demand for administration capable of coordinating complex transition processes at speed and scale, but also with responsiveness and care for all those affected. Both capability and capacity building are needed for the local administration to integrate RRI-AIRR in territorial governance. This requires



leadership, top-level vision and strategy, and the rewarding of institutional improvement to facilitate change towards mainstreaming RRI-AIRR.

The proposed RRI-related measures focus on inclusive programming and financial sustainability, fostering environmental awareness in society and particularly amongst young people and business investors, as well as developing new ways of valuing the social impacts of research and innovation. Focus is placed on increasing the societal relevance of funding and investments, open access instruments/open data, digitalisation of services and administrative procedures, innovation for social cohesion, etc.

Science education is becoming a critical factor for building sustainable, resilient city systems. As the COVID-19 crisis has shown, cities must have reliable infrastructure – comprising institutional, human, and financial resources – which can quickly adapt and respond to crises. In the future, cities will have to be prepared to function in circumstances with a high degree of urgency, uncertainty and unpredictability; this requires multi-disciplinarily collaboration and depends on responsibility-sharing among stakeholders. Sofia should seek to build flexible, multi-functional teams capable of solving emerging problems at speed and scale.

Public engagement plays a key role for defining long-term priorities. It is also important for monitoring, evaluation, and control of policy implementation, thus improving accountability and transparency. Thirdly, public engagement creates a sense of shared responsibility, legitimacy, and trust in public institutions. Open data policies are considered prerequisite for facilitating cooperation among stakeholders in an accountable, transparent way. Access to data increases the quality of idea generation, innovation and development of digital technologies. Ethics and integrity are important to overcome the low levels of trust in public institutions.

RRI RELATED MEASURES	
Public engagement	<ul style="list-style-type: none"> • Develop an annual municipal communication and public engagement plan. • Increase the use of the city online communication platform for public consultations.
Open access	Creating databases with solutions and open access tools that can be used by all stakeholders.
Gender equality and diversity	Establish a gender and diversity board to assess all sustainable development projects; consult with gender and equality experts to ensure that technological, green and social innovations are free of systemic bias and any form of discrimination; include provisions for monitoring and redress procedures.
Ethics	Appoint an ethics board to consult the preparation and implementation urban development projects.
Science education	Engage experts from the industry, academia, and NGOs to ensure research results are adequately communicated to policy- and decision makers.

Objective 2: Increase the administrative and expert capacity of Sofia Municipality

OBJECTIVE AND ACTIONS	TIME FRAME
-----------------------	------------



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101006439

OBJECTIVE 2:	Increase the administrative and expert capacity of Sofia Municipality	
Action 2.1	Develop continued training programs for the municipal administration by 2025.	2025
Action 2.2	Create appropriate incentives for career development in the administration.	2024
Action 2.4	Organize design seminars and innovation camps for the municipal administration and stakeholders for capacity building and exchange of expertise.	2027

Elaboration and justification

This objective seeks to fill in an important gap identified by experts and stakeholders concerning the skills and capacity of the municipal staff to govern the local R&I ecosystem. The objective responds to the need for an administration capable to run a knowledge-based economy, driven by data and digitally enhanced work processes.

Relation to ongoing policy processes/strategies

It is based on analysis of key policy documents concerning urban development and is aligned with current municipal strategies such as Vision for Sofia 2050 and Program for Sofia 2027.

RRI-AIRR Framework

The rationale for including specific RRI-related measures is described above.

RRI RELATED MEASURES	
Public engagement	Develop an annual communication and public engagement plan for the municipality. Increase the use of online platforms which allows individuals/businesses to participate in public consultations.
Open access	The municipal directorate responsible for digital transition should draw up an open access regulation, facilitating third-party access to data and development of e-service solutions.
Gender equality and diversity	Establish a gender and diversity board to ensure training programs are free of systemic bias and any form of discrimination.
Ethics	Appoint an ethics board to consult the preparation and implementation of the training programs are free of bias and any form of discrimination.
Science education	Use the expert potential of businesses, academia, and NGOs to develop state-of-the-art learning content and delivery formats.



AIRR reflections

Concerning the **AIRR dimensions** (anticipatory governance, inclusiveness, responsiveness, and reflexivity), findings from RRI-LEADERS indicate that most are reflected in the administrative practices and processes, although they are rarely described with the same terminology. Overall, public bodies are seen as responsive and adapting to the needs of citizens. On the other hand, while there seems to be sound expertise to conduct analyses as part of the policymaking process, there is lack of sufficient capacity in defining strategic goals and creating long-term visions (**anticipatory process**). Regarding **inclusiveness**, one problem is the insufficient capacity of the administration to analyze available data to design public services tailored to specific social groups and groups with special needs. **Inclusiveness** and **public engagement** are understood rather narrowly as a means of receiving feedback from the citizens/clients/end users of services or simply sharing information with citizens. They are often conflated/confused with citizen participation. In terms of **reflexive governance**, potential barriers are administrative system elements which are not responsive and do not cooperate.

At organizational level, regular meetings for review and assessment of the implemented actions need to be conducted, with a special focus on public engagement formats and their impact on policies. Municipal directorates are encouraged to plan such reviews and to invite citizens to the public forums.

Communication and Dissemination

Relevant communication activities will be planned with the aim to improve the overall awareness about RRI and its integration in territorial development among policy- and decision-makers and local stakeholders. Communication measures related to the implementation of RRI keys and AIRR dimensions will be embedded in the respective sectoral policies, with the purpose to encourage better policy coordination and alignment of communication efforts across municipal departments.

Proposed actions include:

1. Developing an annual communication and public engagement plan, which integrates measures across policy areas and promotes concertation activities.
2. Organizing public discussions and forums to communicate policy-relevant innovation and research results (e.g., during the Night of Researchers or Sofia Science Festival).
3. Organize annual conference on the future of Sofia, inviting experts, stakeholders, and citizens to deliberate on the future challenges and vision for the city.
4. Plan and organize regular online or in-person meetings (at district/municipal level), where the local government can report on the achievement of planned measures.
5. Establish and maintain a media partnership to ensure regular, comprehensive, and timely information to the citizens on city-related issues.



Cross-Cutting Priorities

All of the proposed activities and measures in the TO respect the horizontal principles of equal opportunity, non-discrimination (including based on national or ethnic origin, color, religion, age, mental or physical disability or sexual orientation), sustainable development and accessibility (green public procurement, nature-based solutions, lifecycle costing criteria, avoiding negative environmental impacts, climate proofing and 'energy efficiency first principle') during project design and implementation and will have to embed them in the work plan.

Quadruple helix stakeholders are expected to observe the following principles in their work, at individual and institutional level:

- Promote the use of sustainable, renewable forms of energy, where available, and monitor and seek to reduce energy and water consumption in the context of their work.
- Promote green purchasing for all work-related materials and the use of sustainable alternatives to single-use plastics and consumable items, including the use of reusable, recyclable and/or the most biodegradable alternatives.
- Support the use of the most sustainable and low-carbon forms of transportation possible for all aspects of work implementation, including for project meetings and conference attendance, where feasible, even where other more economical and/or faster travel options exist.
- Support the use of carbon offsetting in those cases where carbon emissions cannot be avoided.
- Support young researchers and innovators in developing greater awareness on environmental sustainability.
- Promote awareness of sustainability issues arising from research and innovation projects and of sustainability goals and initiatives more generally (such as the European Green Deal and the UN Sustainable Development Goals), including in the context of public outreach, communication and dissemination activities.
- Share ideas and examples of best practice for improving the sustainability of research projects, including on social media, and to help inspire others to reduce the environmental impact of their research and innovation-related activities.



Bibliography

- Klaassen, P., Kupper, F., Rijnen, M., Vermeulen, S., & Broerse, J. (2014). *D1.1 Policy Brief on the State of the Art on RRI and Working Definition of RRI*.
- Stilgoe, J., Owen, R., & Macnaghten, P. (2013). Developing a Framework for Responsible Innovation. *Research Policy*, 42, 1568–1580.
- von Schomberg, R. (2011). Towards Responsible Research and Innovation in the Information and Communication Technologies and Security Technologies Fields. *SSRN Electronic Journal*.

