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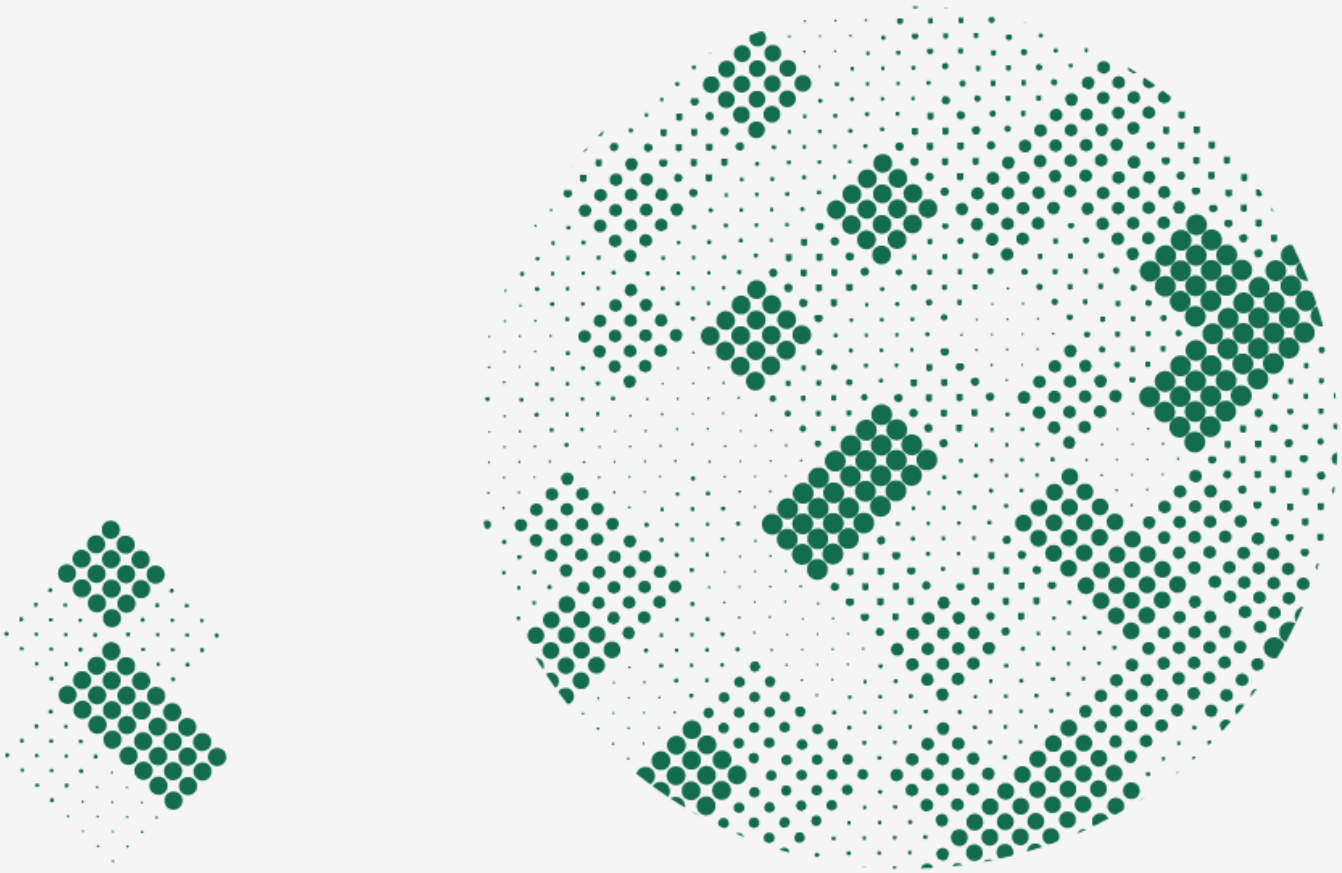
RESPONSIBLE RESEARCH AND INNOVATION IN TERRITORIES

RRI AUDIT REPORT
Sofia Municipality
Bulgaria



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

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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.
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RRI AUDIT REPORT
SOFIA MUNICIPALITY

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Delivery date	10 December 2021

Document revision history

Version	Date	Author/Contributor	Revision
1	25.10.2021	S. Gabova, S. Lomeva	
2	30.10.2021	Z. Damianova, M. Hajdinjak	Comments
3	25.11.2021	S. Gabova	Input to focus groups section
4	6.12.2021	M. Hajdinjak, Z. Damianova	Input to focus group section
5	8.12.2021	S. Gabova	Final revisions

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List of acronyms / abbreviations used in this document

AIRR – Anticipation, Inclusiveness, Reflexivity, Responsiveness
DTSS – Digital Transformation Strategy for Sofia
FDI – Foreign direct investment
ISSS – Innovation Strategy for Smart Specialization of Sofia
KPI – Key performance indicator
NGO – Non-governmental organization
R&I – Research and innovation
RRI – Responsible Research and Innovation
SM – Sofia Municipality
SYS – Sofia Youth Strategy 2017-2027

Executive Summary

This report presents the findings of the RRI territorial audit for Sofia Municipality. The audit comprises analysis of the municipal institutional and policy framework in four selected policy areas (*support for innovation, digital transition and new skills, sustainable urban development, youth employment and entrepreneurship*) with regard to the integration and implementation of RRI-AIRR keys and principles. The report draws upon analytical work and information gathered through semi-structured interviews with representatives of quadruple-helix stakeholders in Sofia (academia and research institutes, business, NGOs, and policymakers), focus groups, and desk research. Activities were carried out in the period April – December, 2021 by the project partners ARC Fund and Sofia Development Association. The report assesses the state of the art regarding the application of the RRI-AIRR framework by the local government in the abovementioned policy areas and on that basis, proposes strategies for improving territorial governance through a streamlined integration of the RRI-AIRR in the policymaking process.
The report concludes that RRI-AIRR keys are relatively well embedded in policy documents and plans; while the policy rhetoric rarely uses the exact terminology and vocabulary of the RRI-AIRR framework, comparable principles are referred to in the municipal documents and also practiced by the administration. Desk research has shown that there are well-developed and comprehensive strategy documents in the chosen policy areas, most of which cover a seven or ten-year period of forward planning.

The audit reveals that some RRI keys (public engagement, open access, gender equality) are better known and more adequately reflected in the policy areas (e.g., sustainable urban development, support for innovations) in comparison to other keys (e.g., science education, research ethics). Overall, policymaking is assessed as anticipatory and responsive, relying on broad public engagement (mostly through citizen consultations) and input from academia, business, and civil society. Public bodies responsible for policy implementation (in particular in the areas of digital transition and sustainable urban development) pursue and rely on broad public engagement, inclusiveness, foresight scenarios, transparent and accountable programming. These principles are contained both in their internal codes of procedure as well as in the respective policy guidelines. Other municipal units and departments show a lower level of awareness of the RRI-AIRR approach and hence, the full potential of its application in organisational policies remains unused, despite the presence of practices that contain elements of RRI keys and AIRR dimensions.

As regards the experience of the quadruple helix stakeholders with the RRI-AIRR framework, the analysis shows diverse and uneven knowledge and practices across sectors. Representatives of the academia are better informed and therefore can provide better input to municipal policymaking, in comparison to the business or NGOs. Nevertheless, uptake of scientific research results in policy-making is still marked by slow and bureaucratic procedures. Lack of adequate communication on strategic priorities with the public also limits active citizen engagement in policy making/implementation. While Sofia is yet to establish a city science office or a similar unit to coordinate urban research and innovations, various forms of collaborations and trajectories involving local stakeholders bring added value to the city economy and contribute to the well-being of citizens.

Based on the analysis, the report formulates several strategic policy priorities to be pursued by local policymakers in order to ensure more coherent and consistent application of the RRI-AIRR principles and thus, a more citizen-centred, open, transparent and inclusive governance. These priorities are clustered in the following five groups:

1. **Institutional framework**: political leadership and municipal bodies responsible for strategy implementation.
2. **Strategic policy framework**: alignment of the municipal strategies with national and EU-level strategic and programming documents.

3. **Capacity building** for RRI and AIRR-based territorial governance and promotion of multi-actor and multi-stakeholders alliances supporting RRI-AIRR .
4. **Communication and engagement** with citizens and stakeholders
5. **International learning** and cooperation with stakeholders at local/national/EU level.

The current report and the recommendations made aim to inform the transformative outlook to be produced for the territory of Sofia Municipality by the end of the RRI-LEADERS project.

Introduction

About the RRI Audit Report

The purpose of this report is to integrate the results from previous activities (stakeholder mapping of policy actors, best practices related to the use of RRI-AIRR in public policymaking) conducted in Sofia and to produce a summary assessment of the state-of-play in regard to RRI keys and AIRR dimensions. This exercise completes the process of co-creation and gathering of information from quadruple helix partners (interviews, focus groups, participatory workshop). The audit aims to assess the information and to propose conclusions and actionable recommendations to local government on how to improve the application of RRI keys in strategic programming. In this sense the report also seeks to generate ideas for territorial governance and the municipal policy framework which will be included in the transformative outlook for Sofia. The ideas and proposals received so far from the stakeholders as well as from the documentary analysis are a valuable opportunity for triggering institutional change and transformation by introducing and legitimising new policy approaches and organisational practices. The territorial audit report which also provides a systematic analysis of the level of engagement and responsibility of quadruple helix partners can act as a catalyst for institutional change by advancing new attitudes, principles and practices on how to address a policy problem in a responsible and accountable manner.

Methodology

The report sums up the key findings, conclusions and recommendations concerning the implementation of the RRI-AIRR framework in policy and strategic planning at Sofia Municipality, with a focus on four policies: *support for innovation, digital transition and new skills, youth employment and entrepreneurship, and sustainable urban development*. The analysis steps on the inputs of deliverables *Mapping of stakeholder relationships and interdependencies* and *Territorial report of Sofia Municipality*. The two reports are based on input from quadruple helix partners with knowledge and experience in the four policy areas and RRI-AIRR practices, which was obtained through individual semi-structured interviews in the first phase of the project (April-May, 2021), followed by a focus group (held in May 2021) and a participatory workshop with representatives of academia, NGOs, policymakers, and the business (held in July 2021). 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. The current report also draws upon desk research of current strategies and policies of Sofia Municipality in the four policy areas mentioned above. Documentary analysis of relevant national-level legislation, strategies and programmes related to RRI was conducted and the following documents have been reviewed:

National-level documents

- National Plan for Development of the Open Science Initiative in the Republic of Bulgaria
- National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030
- National Roadmap for Research Infrastructure 2017-2023
- Innovation Strategy for Smart Specialisation
- Strategy for Effective Implementation of Information and Communication Technologies in Education and Science in the Republic of Bulgaria (2014-2020)
- Act on Development of the Academic Staff in the Republic of Bulgaria
- Scientific Research Promotion Act
- Higher Education Act
- Law on Equality between Women and Men
- Law for Protection against Discrimination

Municipal documents

- Innovation Strategy for Smart Specialisation of Sofia
- Digital Transformation Strategy for Sofia
- Sofia Youth Strategy 2017-2027
- Vision for Sofia 2050
- Programme for Sofia 2021-2027.

For the completion of this report, additional documents and reports related to the development and implementation of municipal policies were consulted; informal discussions were held with representatives of the municipal administration in charge of implementing action plans linked to relevant policies (for example, digital transition, culture, youth activities). For the completion of the audit, a SWOT analysis of the current level of awareness of and application of the RRI-AIRR approach has been carried out. Drawing upon the SWOT, a complementary TOWS analysis has been made, which outlines key strategic priorities and measures for integration RRI keys and/or AIRR dimensions in the municipal policy-making procedures and governance.

The report concludes with recommendations to local policy- and decision-makers on how to identify opportunities/policy areas for integration of the RRI-AIRR approach in future municipal policy-making and strategy development.

Policy areas

The ambition of the local government 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. The four policy areas chosen by the municipality reflect this ambition and contribute to its implementation. While RRI-AIRR principles are not explicitly highlighted as guidelines in strategic planning and implementation, the municipal administration strives to translate the results of applicable research and innovation into its practices and governance models. The overall goal for the city authorities is to strengthen the role of research and innovation in policy making, and, through ongoing dialogue and exchange with local and national stakeholders, to pursue strategic planning which is anticipatory, responsive, and inclusive.

Policy area SUPPORT FOR INNOVATION

The policy initiatives in this area aim to strengthen the innovation ecosystem in the municipality. Sofia is home to one of the most developed start-up ecosystems in Central and Eastern Europe and is the start-up hub of the Balkans. Sofia Municipality was the first in Bulgaria to draft its own strategy for smart specialization – the *Innovation Strategy for Smart Specialization of Sofia* (ISSS), which focuses on two of the four sectors from the national Smart Specialization Strategy, i.e. Informatics and ICT and new technologies in the creative and recreational industries.

Strategic priorities in ISSS include securing financial capital and access to the market for innovative SMEs and start-ups, development of digital technologies. Science education is emphasised as key to cultivating highly-skilled human capital. Main stakeholders in the policy area include the municipal administration and municipal bodies (e.g. InvestSofia, Municipal Guarantee Fund, InnovativeSofia), local industry and business clusters, universities, start-up associations.

Main challenges relate to the need for better communication between the municipality, citizens, academia and the industry in the implementation of policies. With regard to academia, 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, current policy documents do not include questions of gender equality, ethics/research ethics. Although not specifically mentioned, AIRR dimensions linked to anticipatory, responsive, and reflexive governance are embedded. Nevertheless, the current implementation, monitoring and evaluation measures and the role of the Monitoring Committee could be revised to accommodate AIRR dimensions; some KPIs could be revised to reflect more fully those dimensions as well.

Key considerations for the transformative outlooks and the political and societal transformation process in the policy area:

- 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.
- Increasing the competitiveness of the municipality and developing the knowledge economy, establishment of new mechanisms for incubation and financing.
- Whereas various initiatives are implemented to support technological innovations and start-ups, less attention is paid to innovations in the public administration sector. Steps are being taken in this direction as well (for example, the participation of Sofia in the project *PolicyCloud*, a Horizon2020 initiative, which will create a cloud-based tool for effective policy modelling, testing and management through data analysis and visualization; Sofia is one of the pilot cities.)

Policy area SUSTAINABLE URBAN DEVELOPMENT

Policies in this area are described in the Integrated Municipal Development Plan (a new plan is being developed for the period 2021-2027, due to be voted by the Municipal Council by the end of 2021). The Plan sets medium- to long-term goals for sustainable city development (infrastructure, economy, human capital, culture and education); forecasts for socio-economic and spatial development; guidelines for the management of city functional systems. The vision for the city stated in the Plan is: "*Sofia Municipality is a more adaptable, sustainable, inclusive and diverse municipality, focused on the knowledge economy and offering a higher quality of life in a cleaner environment."*

The strategic priorities set forth also focus on improving its connectivity and digital infrastructure through environmentally friendly, smart and cost-effective solutions. Municipality-wide measures are planned to build ecosystems for smart, green, climate-neutral, sustainable growth, reducing the consumption of raw materials and supporting innovations in production processes. Long-term goals are set to help implement the EU political objectives, e.g. through local Green Deals and lead tech uptake for better life. Further strategic goals focus on building a more competitive local economy based on innovation and a sustainable increase in the share of employment in sectors with high added value and export potential.

The main challenges that have been identified relate to the lack of efficient communication between the municipal departments in charge of implementing the policy; silo-thinking; 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 is a part of the overall atmosphere of distrust in public institutions and scepticism about their capacity to apply efficiently new knowledge and ideas.

Main stakeholders for policy implementation include the municipal enterprise SofiaPlan, which is in charge of developing the Plan; the municipal council, which has to approve the policy. Academia, civil society and the business have a high interest in the policy as beneficiaries but also as sources of knowledge, expertise and good practices. On the other hand, they do not have a strong-enough standing and have no decision-making powers (despite their involvement in consultative and advisory bodies at the municipality).

Key considerations linked to the desired transformations in the chosen policy areas relate to improving the structure and organisation of the municipal administration; it is recommended to optimise and reorganise the administrative processes in the municipality, in order to improve strategic planning, development and social inclusion. Key factor for achieving the policy objectives is strengthening the administration's collaboration with universities and research institutes, and in general seeking external expertise from private and public bodies with a capacity to influence the uptake of relevant research results.

Policy area YOUTH EMPLOYMENT AND ENTREPRENEURSHIP

The main document is the *Sofia Youth Strategy 2017-2027* (SYS).[1] According to the document, Sofia needs to grow into a city of the young, the active and the innovative. The strategy aims to provide young people in with skills for lifelong learning, competences for development, prosperity and autonomy, and active social participation in the public decision-making process. Given 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 organisations, youth services and youth workers, by connecting them with educators and employers, and by creating various programmes that meet the interests, needs and experiences of young people.

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

Strategic priorities include the creation of favourable conditions for education, affordable and accessible to all; professional, social and personal realisation of young people, their participation in socio-economic life, and involvement in public governance. A further priority includes promoting active and healthy lifestyles of young people. Among the other strategic objectives are continuing education and youth entrepreneurship, youth career development and support for youth innovations and start-ups.

Challenges identified in the implementation of the strategy related to cooperation among stakeholders (municipality, youth, universities, civil society). More funding instruments are needed to support innovative projects and start-ups, despite the existing municipal small grant schemes (among them *Financing Innovative Start-ups Programme*, *Social Innovations Program*, *Program Culture* and *Program Europe*). The municipality has established a youth council, which advises on and takes part in the implementation of the strategy. Despite that, a general apathy and lack of interest in young people to engage in public life is noted (which may be due also to the numerous volunteer and civic engagement opportunities in the city). Therefore, novel ways of engaging with youth through digital technologies could become a priority in the coming years.

Main stakeholders include schools, universities; youth councils in schools and universities, informal associations of young people, non-governmental organisations established by or working with young people; business clusters and associations. Those with high interest in policy implementation include youth councils and NGOs established/run by young people. In terms of their capacity to influence policies, NGOs and youth organisations with wide representation are more likely to play a key role.

Key considerations regarding the youth policy include, first of all, introducing gender equality measures in the strategy. This is so far missing from the document, as is the case with other strategic programmes. Secondly, new priorities in line with the national and EU-level strategies for 2027 have to be formulated (e.g., EU Green Deal, EU Youth Strategy 2019-27, Digital Education Action Plan 2021-27) to support young entrepreneurs. Students could be given tasks such as developing business plans or designing urban development projects, which would earn them credits in their studies.

Policy area DIGITAL TRANSITION AND NEW SKILLS

According to the Digital Transformation Strategy for Sofia (DTSS, adopted in 2020), the long-term vision for the city is: “Sofia systematically achieves sustainable economic growth and develops a high value-added economy through the introduction and use of high technology in all areas of public and economic life. Sofia develops as an innovative, intelligent, modern, progressive and high-tech city, an attractive centre and a preferred place for living, business and R&D.”

This policy responds to the rapid development of digital technologies and aims to make the city future-proof, ready to cope with the challenges of tomorrow. At present, Sofia offers one of the highest Internet speeds in Europe and has a vibrant start-up and entrepreneurial ecosystem. The DTSS includes measures to establish Sofia as a European technology leader, open to citizens and the industry; an innovative hub for the R&D potential of the technology sector; an expanding market for locally developed products and solutions; and a recognisable location for testing smart urban solutions. The InnovativeSofia unit in the municipality is taking steps to make the city’s efforts more visible and to set an example by becoming early adopters of tech innovations.

The following barriers to the policy implementation have been identified:

- Financial constraints - choosing the right investment that will create a long term impact.
- Lack of experience with developing foresight scenarios: the city administration needs to develop future scenarios considering the impact of transformative technologies, and overall, to improve its capacity for anticipatory governance. With regard to public engagement and citizen participation an integrated digital platform for citizen participation and communication is needed. At the time of writing this report, such a platform is being developed as part of the city's participation in the project *PolicyCloud* (https://innovativesofia.bg/en/project/policycloud-2/).

Main stakeholders and key actors include Sofia Municipality (the InnovativeSofia department), representatives of the local ICT ecosystem, other municipal units, e.g. SofiaPlan; stakeholders from the local smart city ecosystem, research/academia, businesses.

Key considerations for the transformative outlook and the political and societal transformation process in the chosen policy area:
1. Include gender dimensions/gender equality linked to digital transition, transformative technologies, digitalization; DTSS currently does not mention gender and has no specific measures for promoting gender equality.
2. In terms of leadership and management, the InnovativeSofia unit has so far proven successful and it has the potential to grow into a smart city research and technology coordinating point. Implementation of (digital) participatory models of governance, digital collaborative ecosystems are important objectives for digitalization of the city, next to public e-services. Under the PolicyCloud project, a new digital tool enabling the integration of data collection, modelling and simulation technologies will be developed. This is an incentive for the city to harness the potential of big data analytics and cloud technologies to improve the modelling, testing and realisation of policies.

Synthesis of experiences related to RRI-AIRR

Conclusions from the documentary analysis, interviews and focus groups largely confirm the view that RRI keys and AIRR dimensions are (implicitly) known and followed in policy-making and implementation; they are not formally included in internal documents or codes of procedure. RRI keys, for example, public engagement, open access, gender equality, are more easily recognised and followed; science education and research ethics are thought as pertaining mostly to academia and only in specific cases relatable to policy development. The levels of awareness of the RRI keys among academia, municipal staff, business, NGOs differ widely; the framework is better known by those who have participated in EU funded projects (e.g. Horizon2020) or have undergone professional training in the subject. For **public bodies** most important is public engagement, followed by open access/open data, science education/research ethics. **Public engagement** is key to policy development, implementation, and impact assessment (for all target groups); it is broadly understood as a type of "social contract" between institutions and citizens in terms of responsibility.

Creating communication spaces and participatory mechanisms in order to maintain a high degree of participation in RRI and AIRR is considered by all stakeholder groups as a necessary driver of change. 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 organisation). Therefore, they can be "institutionalised" only by creating appropriate permanent administrative and communication spaces and procedures inside the organisation.

With regard to the **AIRR dimensions** (anticipatory governance, inclusiveness, responsiveness and reflexivity), the majority of the respondents see them reflected in the administrative practices, although they are rarely described using this specific 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**).

As a whole, the current strategic priorities and objectives set by the municipal administration in the four policy areas only partially reflect the RRI-AIRR framework. According to the participants in the focus groups and workshop, some of the reasons relate to **external**, others to **internal factors**. For example, the systematic discourse of RRI has only recently become mainstream, mainly in academia and research organizations, but not in public administration. Other reasons have to do with the fact that there is no research unit within the municipality that could be tasked with providing background studies, impact assessment, etc. in strategy development. A further reason deals with the (lack of) political commitment to set integrated objectives for smart transformation in Sofia. There is "diffusion of powers/mandates/capacity" between the central and district municipalities; levels of capacity vary across district administrations which impacts on the overall quality of performance.
Finally, while communication and cooperation with **stakeholders** (public engagement, inclusiveness) is regarded by all as critical for success, little is done to raise their capacity; as stated by a respondent, "it is important to provide continuing support, to build the skills and capacity of stakeholders to lead the process of change." Last but not least, the level of engagement of civil society largely depends on funding (which is lacking, in most cases) and the proactive approach of the municipality of reaching out to citizens and civil society organisations. Thus, the role of Sofia Municipality is seen as supporting the process (either financially or through other means) and integrating the efforts of all those involved.

In what follows, the report looks at each policy area and discusses the extent to which the RRI keys and AIRR dimensions are embedded in the respective policies and practices; a brief overview of the main barriers and drivers to integrating the RRI-AIRR approach is provided.

Policy area SUPPORT FOR INNOVATION
The current municipal strategy for smart specialisation 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. drawing from connected policy fields); partnership and teamwork, publicity, transparency and citizen participation (engagement). "Integrity" and "protection of public interest" are put forward as leading principles for implementation. Since the ISSS does not explicitly refer to the questions or use the language of **gender equality, ethics/research ethics, responsibility**, these will need to be incorporated in the next revision cycle.
In terms of AIRR principles, the strategy steps on analysis and foresight scenarios with regard to the smart specialisation fields for the city. Although not specifically mentioned, it can be claimed that AIRR principles linked to **anticipatory, responsive, reflexive and accountable governance** are embedded in the document.

Barriers and drivers for change. Input from the documentary analysis and the focus groups shows that Sofia Municipality is regarded as the leader of the process of change. The municipal administration is expected to respect the needs of all citizens (by being inclusive and responsive) but should also aim to balance between diverging interest claims. Barriers relate to the "lack of trust" in the municipal institutions to adequately respond to citizens' needs (resonating with a widespread distrust in public authorities as a whole) and to implement policies in a transparent and accountable way. A further obstacle concerns the absence of clear division of responsibilities between national public bodies (ministry of economy, ministry of education, ministry of health) and local governments for the implementation and support of innovations.

In terms of **public engagement/inclusiveness**, the following issues have been identified:

- The **engagement** of groups with special needs (disabilities) has to be improved, either through technological means (to allow people with disabilities to participate) or proactive support to organisations representing these groups.
- There are high levels of disinformation, also at the expert level, concerning scientific research and results, which prevents the successful uptake of innovations; media have no training and knowledge on how to cover science subjects and consciously or not, become accomplices in the process.
- In terms of **anticipatory and reflexive governance**, the process of *ex ante* technology assessment in Bulgaria is weak; not many organisations have this expertise and could aid decision-making. In addition, most software and tech innovations are available in major European languages, however, very few are also in Slavic languages. This is a technical issue which stands in the way of utilising digital technologies in an inclusive and open way (in all policy areas).
- A major obstacle which concerns the innovation ecosystem as a whole is that "legislation lags behind innovations," which prevents academia and businesses to proactively offer innovative products and know-how to the local government.
- The current public procurement system is ineffective and does not support the uptake of innovations.

Drivers of change: open data policies, data sharing, information sharing between municipality (as data owner) and stakeholders (end users of data – businesses, academia, NGOs).

  - Securing funding for the small grants programmes of Sofia Municipality is a factor for success, by engaging in a responsive, inclusive way a variety of local civil society organisations. These programmes include *Programme Europe, Programme Culture, Programme Social Innovations, Programme The Crisis as an Opportunity.* Special strands of the programmes are aimed at vulnerable groups, people with disabilities, migrants.

Policy area SUSTAINABLE URBAN DEVELOPMENT

The main documents that inform activities in this area are the *Vision for Sofia 2050* and the *Programme for Sofia* 2030 (which is the new masterplan for integrated city development). The strategic documents **cover all five of the RRI keys and most of the AIRR principles.**

The *Programme 2030* relies on **broad public engagement, inclusiveness, foresight scenarios, transparent and accountable governance.** Nevertheless, barriers to the full realisation of RRI-AIRR identified by project participants include, for example, lack of measures and incentives to support the internationalisation of innovations for urban development; this diminishes the capacity to attract international investors and research expertise. Further barriers and drivers:

- Regarding **open access and inclusiveness**, one problem is the insufficient capacity of the administration to analyse available data to design public services. **Inclusiveness** and **public engagement** are understood (by stakeholders from academia, business) as a means of receiving feedback from the citizens/clients/end users of services.
- In terms of **reflexive governance**, potential barriers are administrative system elements which are not responsive and do not cooperate.
- Systems of KPIs need to be introduced at each level/unit of government; having standards for outputs and results will guarantee quality and objective evaluation of the work done. Achievement (or failure to achieve) of KPIs will also inform future interventions and changes (which could influence **anticipatory governance** practices).
- **Gender equality** is still narrowly understood in terms of close-to-equal numbers of men and women taking part in activities or having positions in office; it is important to adopt gender equality plans which encompass a wde range of considerations regarding gender dimensions of policies.

- Regarding **responsive and inclusive governance**: the administration has to be anticipative in order to mediate and reconcile private and public interests.

Policy area YOUTH EMPLOYMENT AND ENTREPRENEURSHIP

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. These include **civic participation** through a broad consultation process; the objectives set in the Strategy support **access to open data, inclusiveness and engagement,** and **(science) educatio**n. As concerns the AIRR dimensions, the Strategy mentions 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.

With respect to **barriers and drivers for change**, the following main conclusions have been drawn from the interviews, focus groups, and participatory workshop.

- When it comes to **public engagement and inclusion**, there is need for more dialogue between public bodies, the private sector and youth organisations; more efforts are needed to give voice to all citizens, in particular to underrepresented groups and young people with special needs.
- **With respect to self-reflection/self-assessment in policy implementation,** the element of the *build-measure-change* cycle or of 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 organisational structures and practices, not yet adopted by the city.
- With respect to **responsiveness and inclusiveness**, an existing barrier is the lack of effective long-term collaboration with organisations from the business sector, so that initiatives for youth entrepreneurship can be pursued.
- A potential **driver for change** could be collaboration (engagement with) all stakeholders – schools, businesses, universities, to define a framework of future skills needed for the local economy. In this process, the leading role should lie 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).

Opportunities to include RRI and AIRR in the policy area: The SYS does not focus on **gender equality, ethics, or science education**. These issues need to be reflected in a revised version of the SYS, also in light of new EU initiatives, such as the Next Generation EU.

Policy area DIGITAL TRANSITION AND NEW SKILLS

The main policy document is the *Digital Transition Strategy for Sofia* (DTSS). Documentary analysis has shown that **public engagement** is essential part of its implementation; information exchange and communication; participation, collaboration, (co)-production; participatory decision-making; and open governance are all described in the document as methods of **public engagement** and **inclusiveness**. The DTSS itself is the result of a broad consultation process with over 100 stakeholder organisations city-wide. **Open data, access to data**, open source software are listed as prerequisites for the implementation of the DTSS. In terms of **science education**, specific Strategy objectives aim to encourage university education in STEM, informatics, as well as entrepreneurship in these fields. No considerations of **ethics**, including research ethics and ethical issues linked to digital transition are mentioned; ethical issues (also linked to use of AI, public e-services, etc.) are critical for a just digital transition and should provide an overarching framework for broad stakeholder engagement.

Barriers and drivers of change:

- In terms of **open access to data**, an existing barrier is the lack of compatibility and verification mechanisms for standardising 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 and ideas for change.
- **Ethical principles** need to be observed in conducting policy impact analyses (*ex ante*). Systematic analysis of social impacts is mainly done by researchers, but anticipation approaches like foresight studies or horizon scanning are not routine practice.
- **Public procurement** procedures need to be reorganised to allow for better alignment with the RRI-AIRR approach.

Drivers of change: There are internal administrative procedures for **self-assessment/reflexive governance**, but they vary across municipal departments. These procedures are often updated to include new KPIs for quality and effectiveness, and for process monitoring. Digitalisation can improve this process and will introduce standardised protocols for monitoring and evaluation. Utilising digital tools for citizens consultations is another opportunity to be exploited.

A Digital Board comprising local quadruple helix stakeholders and tech companies supports the implementation of the Digital Strategy. Membership is open (by invitation from the deputy-mayor for digitalization).

Stakeholders mapping Synthesis of experiences related to RRI-AIRR

Table: Systemic categorisation of stakeholders for the Capital City of Sofia

Stakeholder organisation	Stakeholders with high levels of interest in RRI	Stakeholders with high levels of experience in RRI	Stakeholders with high levels of influence on RRI in practice	Stakeholders with high levels of power
Policymakers				
Programme Europe		Experience with public engagement and inclusiveness		
SofiaPlan		Experience with all RRI keys	Influence regarding all RRI keys and AIRR principles	Power to reassess decision-taking practices through reflection
Sofia Investment Agency	Interest in open access, science education	Experience with AIRR (responsiveness, reflexivity, anticipatory governance)	Influence regarding all RRI keys and AIRR principles	
Sport and Youth Activities Directorate, Sofia Municipality	Interest in science education, gender equality, open access	Experience with public engagement science education	Influence regarding all RRI keys	
Innovative Sofia	Interest in all RRI keys	Experience with all RRI keys		Power to reassess decision-taking practices through anticipatory governance, responsiveness
State Institute for Culture	Interest in gender equality, ethics			
EU Committee of the Regions (BG representative)	Interest in all RRI keys	Strong experience with all RRI-AIRR dimensions	Influence regarding all RRI keys	Power to influence debate and change in smart city policies
British Council Sofia	Interest in science education, gender equality, open access	Experience with public engagement science education	Influence regarding science education, public engagement	
State Agency for E-government	Interest in open all RRI keys	Strong experience with open access	Influence regarding all RRI keys, esp. open access	Power to influence policies and practices regarding open access
State Agency for Research and innovation	Interest in all RRI-AIRR dimensions	Experience with all RRI-AIRR dimensions	Influence regarding all RRI-AIRR dimensions	Power to influence all RRI-AIRR dimensions
Sofena	Interest in science education, public engagement	Experience with RRI-AIRR dimensions	Influence regarding all RRI-AIRR dimensions	
National Association of Municipalities in Bulgaria	Interest in all RRI-AIRR dimensions	Experience in all RRI-AIRR dimensions	Influence regarding all RRI-AIRR dimensions	
National Centre for Public Health and Analyses	Interest in science education, ethics, open access	Experience in ethics, open access, science education		
Research and Academia				

Technology Transfer Office		Experience with science education, public engagement, ethics		
International Business School	Interest in science education, ethics, gender equality, public engagement	Experience with science education, public engagement, ethics		
Sofia University St. Kliment Ohridski	Interest in science education, ethics, gender equality, public engagement, open access	Experience with all RRI-AIRR keys	Potential influence on ethics, science education, gender equality, open access	
University of National and World Economy	Interest in science education, ethics, gender equality, public engagement, open access	Experience with all RRI-AIRR keys	Potential influence on ethics, science education, gender equality, open access	
University of Library and Information Technologies	Interest in science education, ethics, gender equality, public engagement, open access	Experience with ethics, science education, public engagement, gender equality, open access		
Sofia Tech Park	Interest in science education, ethics, gender equality, public engagement, open access	Experience with science education, public engagement, ethics	Potential influence on science education, ethics, open access	
Businesses				
Electric Vehicles Industrial Cluster	Interest in science education, public engagement, open access	Experience with science education, public engagement	Potential influence on science education, open access practices	
Innovation capital				
Virtech Ltd.	Interest in science education, open access			
Microsoft	Interest in science education, public engagement, open access	Experience with science ed, public engagement, open access		
Bulgarian Start-up Association	Interest in science education, ethics, open access	Experience with science education, open access		
Lime	Interested in open access			
Obecto Digital Cooperative	Interested in open access, science education	Experience in public engagement, ethics		
PolicyConsult Ltd	Interest in public engagement, open access	Experience in public engagement		
NGOs and civil society				
NGO Links	Interest in open access, public engagement	Experience with open access, public engagement, ethics	Potential to influence practices regarding open access	

Rinker center	Interest in public engagement, science education	Experience with science education		
Bulgarian School of Politics	Interest in open access, public engagement, gender equality		Potential to influence practices regarding RRI keys	
Foundation “The Duke of Edinburgh's International Award – Bulgaria”	Interest in public engagement, science education	Experience with public engagement, science education		
Maria’s World Foundation	Interest in public engagement, gender equality, ethics, open access	Experience with public engagement, ethics, gender equality	Potential to influence ethics, gender equality, responsiveness, inclusiveness	
Reach for Change Bulgaria	Interest in public engagement, science education, ethics, gender equality	Experience with public engagement, ethics		
SOfiaGREEN project	Interest in science education, open access, public engagement	Experience with public engagement, open access, science education	Potential to influence practices re: public engagement, open access, science education, responsiveness, anticipatory governance	
Health & Life Science Cluster	Interest in science education, open access, public engagement, ethics, gender equality	Experience with ethics, science education, open access		
Workshop for Civic Initiatives	Interest in public engagement, gender equality, ethics, open access	Experience with all RRI-AIRR dimensions	Potential to influence public engagement, science education, open access	
Association Parents	Interest in public engagement, science education	Experience in public education	Potential to influence public engagement, science education, ethics	
Institute for Regional and International Studies	Interest in public engagement, open access	Experience with public engagement		
Bulgarian Council on Refugees and Migrants	Interest in public engagement, gender equality, ethics, open access	Experience with public engagement, ethics, gender equality		
Forum Civic Participation	Interest in all RRI-AIRR dimensions	Experience with all RRI-AIRR dimensions	Potential to influence all RRI keys	
BCause Foundation	Interest in all RRI-AIRR dimensions	Experience with all RRI-AIRR dimensions		
Association Bulgarian Women in Technology	Interest in science education, gender equality	Experience with science education, gender equality		

SWOT/TOWS analysis

SWOT analysis

Internal factors	
Strengths – territorial stakeholders and policy areas **Stakeholders**: Some of the RRI keys are well embedded in and practiced by the research and academic community – open access, research ethics, science education. Civil society organisations and policy makers have a good track record in applying practices that are very close to AIRR dimensions – especially inclusiveness, anticipation and reflective governance. Local stakeholders (youth, NGOs, academia, business) are engaged in consultative bodies working with the municipal administration. **Local policy areas:** **S1** There are well-developed and comprehensive strategy documents in all chosen policy areas **S2** Policy documents relevant for the chosen policy areas reflect well some RRI keys and AIRR dimensions (open access, public engagement, science education, inclusiveness), while others are present in some documents (ethics, responsiveness, anticipation, reflexivity). **S3** Leading EU experience is used to develop digital tools for data collection, policy modelling, testing, and management, which will positively influence practices for anticipatory, reflexive, and responsive governance. **S4** A Digital Board comprising local quadruple helix stakeholders supports the implementation of the Digital Strategy. **S5** Municipal grant making programs developed to support local initiatives by Q4 partners	**Weaknesses – territorial stakeholders and policy areas** **Stakeholders**: Low level of awareness of RRI-AIRR approach and hence, the full potential of its application in organisational policies remains unused, despite the presence of practices that contain elements of RRI keys and AIRR dimensions. Obtaining scientific and technological expertise from local stakeholders is often stalled due to perceived risks of corruption/nepotism/clientelism. There is a need for more public discussions and dialogue between public bodies, the private sector and civil society in support of transparent policy-making. Strategic political commitment to achieving policy objectives is extremely important but difficult to reach. **Local policy areas:** **W1** RRI keys and AIRR dimensions are not formally set in internal documents or procedural codes. **W2** The current hierarchical model of governance and decision-making is an obstacle to a more effective communication and cooperation between the Sofia Municipality and local stakeholders. **W3** Lack of capacity of the municipal administration to define broad-spectrum, long-term visions for city/territorial development; limited digital skills of the administrative staff. **W4** Strategic documents in the policy areas are not coupled with realistic action plans and sufficient funding. **W5** Lack of synergy of systems (investment, sectoral policies, technology, etc.)

	W6. Lack of capacity to manage cooperation with external stakeholders (misunderstood as corruption risk) **W7** Low level of awareness of RRI-AIRR approach and hence, the full potential of its application in organisational policies remains unused, despite the presence of practices that contain elements of RRI keys and AIRR dimensions. W8 Foresight /anticipatory governance measures in the city administration are limited mostly to a 5-year span.
External factors	
Opportunities (of the external environment) **O1** Good practices from other countries, specifically aimed to improve the integration of RRI-AIRR approach in territorial governance, are a source of knowledge and experience, which can be used and adapted to the local context (e.g. twinning projects and mutual assistance projects between public bodies in Bulgaria and the EU). **O2** The EU and national programmes of the current seven-year programming period (2021-2027) provide numerous and diverse opportunities for applying RRI-AIRR approach in policy design and policy implementation. **O3** The municipal administration and leadership have the potential to become early adopters of bottom-up initiatives and ideas based on the research/innovation results, in order to achieve a transparent, responsive and accountable governance. **O4** Municipality investing in improved and expanded (digital) communication and engagement with citizens and stakeholders. **O5** Quadruple-Helix stakeholders have a high interest in the RRI-AIRR approach, as they perceive it as very relevant.	**Threats (of the external environment)** **T1** Partisan politics preventing the adoption of priority policy measures/funding instruments for territorial development and governance. **T2** Certain segments of society remain isolated from the decision-making processes, especially the vulnerable/underrepresented groups and people with special needs. **T3** Sustained application of the RRI-AIRR approach in the policy-making cycle is blocked/delayed due to shortcomings in the overall administrative set-up of the municipal departments (inefficient communication, cumbersome decision-making procedures). **T4** Insufficient administrative culture/administrative capacity to utilise public private partnerships (PPPs) in support of innovation/cooperation with local stakeholders due to risks of corruption. **T5** Level of competitiveness of local stakeholders in EU programmes is lower compared to stakeholders in other EU countries. **T6** Local/national dynamics of in/outmigration, demographics, and ageing population pose further obstacles to strategic planning and resource allocation (human, financial, material).

TOWS analysis

The **TOWS** (inversed SWOT matrix) analysis is action-oriented and aims to identify the dependencies and relationships between the internal and external factors (identified in the SWOT analysis). This will help partners outline the development strategies and propose actions to take advantage of identified opportunities, exploit existing strengths, focus on minimising/mitigating external threats, and overcome internal weaknesses.

Internal strengths Maximize Strengths to maximize Opportunities (Maxi-Maxi strategy)	**Opportunity 1** Good practices from other countries, specifically aimed to improve the integration of RRI-AIRR approach in territorial governance, are a good source of knowledge and experience	**Opportunity 2** The EU and national programmes of the current seven-year programming period (2021-2027) provide funding opportunities for applying RRI-AIRR approach in policy design and policy implementation.	**Opportunity 3** The municipal administration has the potential to become early adopter of bottom-up initiatives based on research/innovation, in order to achieve a transparent, responsive and accountable governance.	**Opportunity 4** Municipality investing to improve digital communication and engagement with citizens and stakeholders.	**Opportunity 5** Quadruple-Helix stakeholders have a high interest in the RRI-AIRR approach, as they perceive it as very relevant.
S1 There are well-developed and comprehensive strategy documents in all chosen policy areas.		Adopt EU approach of taxonomy analysis of sustainable sector/policy development measures	- Plan pre-commercial procurement for early uptake of innovations and research results - Utilize PPPs for uptake of scientific input to policy making	- Provide funding and introduce digital tools and platforms for communication within the municipality and with stakeholders - Promote business models (and PPPs) that can sustain the digital transition of the city in public services	Invite Q4 stakeholders to regular consultations (through advisory councils) for input to policies
S2 Partial inclusion of RRI-AIRR in policy and practice	Support networking and international cooperation efforts/projects by local stakeholders which have a high interest in the RRI-AIRR approach in strategic planning	Initiate own/support external projects in fields linked to the policy areas to take advantage of available EU funding	Revise public procurement to allow for better alignment with the principles of RRI-AIRR approach	Expand the mandate of InnovativeSofia unit to build digital communications infrastructure in the municipality	Streamline strategic goal setting in policy areas to achieve synergy in development/reporting / monitoring/evaluation of policies with stakeholders participation

S3 Leading EU experience is used to develop digital tools for data collection, policy modelling, testing, and management	Capitalize on existing good practices through EU-level networks in which Sofia participates	Conduct regular reviews of policy and action plans to ensure alignment with EU priorities and funding opportunities	Strengthen collaborations with partner municipalities from EU to improve the integration of RRI-AIRR in the policy process	Utilize participation in EU projects to adopt new digital instruments for policy making and implementation	Promote networking of local Q4 stakeholders with EU partners
S4 Well-functioning units for urban development and digital transition in Sofia Municipality which could serve as examples for policymaking	Promote the positive practices across the municipal administration		Support projects/initiatives for digitalization of municipal operations and communications	Continue the process of digital transition to secure data compatibility across the municipal departments (data sets from the municipality and companies follow compatible formats so that data could be easily integrated, analysed, shared).	More active inclusion of stakeholders in policymaking
S5 Municipal grantmaking programs developed to support local initiatives by Q4 partners	Utilize funding to build capacity for local stakeholders to apply RRI-AIRR		Utilize funding to support pre-commercial procurement and uptake of innovations		Utilize funding programs to encourage learning and capacity building for stakeholders to apply RRI-AIRR

Internal strengths Maximize Strengths to minimize Threats (Maxi-Mini)	**Threat 1** Partisan politics preventing the adoption of priority policy measures	**Threat 2** Certain segments of society remain isolated from the decision-making processes, especially the vulnerable/underrepresented groups and people with special needs.	**Threat 3** Sustained application of the RRI-AIRR approach in the policy-making cycle is blocked/delayed due to shortcomings in the overall administrative set-up of the municipal departments (inefficient communication, cumbersome decision-making procedures).	**Threat 4** Insufficient administrative culture/administrative capacity to utilise public private partnerships (PPPs) in support of innovation/cooperation with local stakeholders due to risks of corruption.	**Threat 5** Level of competitiveness of local stakeholders in EU programmes is lower compared to stakeholders in other EU countries.	**T6** Local/national dynamics of in/outmigration, demographics, and ageing population pose further obstacles to strategic planning and resource allocation (human, financial, material).

S1 Strategic documents with relevant objectives in the chosen policy areas	Strategic planning to be for a 10-year period, with clear KPIs and funding sources per policy objective	Regularly review and revise all policy documents to include measures for inclusion and engagement of vulnerable groups	Ensure that strategic objectives are well communicated to all stakeholders engaged in policy implementation	Build capacity of the administration through regular training	Prioritise local business/technology sectors for funding (through Municipal Guarantee Fund, SofiaInvest, etc.) to achieve policy objectives	More active engagement of the thematic advisory councils working with the Mayor to set up strategic priorities
S2 Partial inclusion of RRI-AIRR in policy and practice	Inform municipal administration /council of the benefits or RRI-AIRR to encourage adoption and improve policymaking	Introduce new/improve existing mechanisms for consultations with the target groups		Build capacity of the administration through training programs	Introduce incentives/requirements for inclusion of RRI-AIRR principles in strategy/policy development	
S3 Cooperation with other EU partners/mutual learning	Promote international cooperation to ensure alignment of policy objectives with EU priorities	Engage in mutual learning programs with EU partners and adopt good practices	Engage in mutual learning programs with EU partners and adopt good practices to improve administrative operations	Initiate own/support projects with EU partners to build internal capacity	Develop in-house training programs for municipal staff	
S4 Well-functioning units which could serve as examples in policymaking (SofiaPlan, InnovativeSofia)			Policy sandboxing for societal impact: test policies, with broad public engagement, before official approval			
S5 Municipal grant making programs support local initiatives by Q4 partners		Use funding to support the involvement of the target groups through pilot projects			Support capacity-building projects for the local stakeholders	Support pilot projects to tackle specific challenges and areas in need of improvement

Internal weaknesses Minimizing Weaknesses to maximize Opportunities	**Opportunity 1** Good practices from other countries, specifically aimed to improve the integration of RRI-AIRR approach in territorial governance, are a good source of knowledge and experience	**Opportunity 2** The EU and national programmes of the current seven-year programming period (2021-2027) provide numerous and diverse opportunities for applying RRI-AIRR approach in policy design and policy implementation.	**Opportunity** 3 The municipal administration and leadership have the potential to become early adopters of bottom-up initiatives and ideas based on the research/innovation results, in order to achieve a transparent, responsive and accountable governance.	**Opportunity 4** Improved and expanded (digital) communication and engagement with citizens and stakeholders.	**Opportunity 5** Quadruple-Helix stakeholders have a high interest in the RRI-AIRR approach, as they perceive it as very relevant.
W1 RRI keys and AIRR dimensions are not formally set in internal documents	Develop internal guidelines using good practices from other countries				Collaborate with Q4 stakeholders to develop internal documents on RRI-AIRR adoption
W2. Hierarchical model of governance and decision-making is an obstacle to a more effective communication and cooperation with stakeholders	Take steps to improve model of governance based on good international practices		Undertake internal reorganizations to strengthen horizontal communications and bottom-up initiatives within municipality	Introduce digital communication to facilitate internal and external communication	
W3. Insufficient administrative culture /administrative capacity		Utilize EU funding to improve administrative capacity through pilot projects		Build internal capacity for big data analysis; train and retain local talent (within the administration)	
W4 No realistic action plans and sufficient funding for policy implementation		Build internal capacity for project development and implementation of EU funded programs			
W5 Lack of synergy between systems (investment, sectoral policies, technology, etc)			Introduce digital communication to facilitate synergy of internal and external communication and data sharing	Introduce digital communication to facilitate synergy of internal and external communication and data sharing	

W6. Lack of capacity to manage cooperation with external stakeholders (misunderstood as corruption risk)			Introduce new procurement procedures that include RRI-AIRR principles and anticorruption measures		Introduce transparent rules for communication with local stakeholders, publish regular reports of the activities
W7 Low level of awareness of RRI-AIRR approach and hence, the full potential of its application in organisational policies remains unused, despite the presence of practices that contain elements of RRI keys and AIRR dimensions.	Participate in EU-wide actions aimed to promote the application of RRI-AIRR	Utilize partnerships to adopt and share good practices on applying RRI-AIRR in the municipal administration and in the cooperation with stakeholders		Utilize digital technologies to increase awareness of RRI-AIRR among the administration and local stakeholders	Strengthen communication and collaboration with stakeholders as a way to improve the awareness of RRI-AIRR

Internal weaknesses Minimizing Weaknesses to avoid Threats	**Threat 1** Partisan politics preventing the adoption of priority policy measures	**Threat 2** Certain segments of society remain isolated from the decision-making processes, especially the vulnerable/underrepresented groups and people with special needs.	**Threat 3** Sustained application of the RRI-AIRR approach in the policy-making cycle is blocked/delayed due to shortcomings in the overall administrative set-up of the municipal departments (inefficient communication, cumbersome decision-making procedures).	**Threat 4** Insufficient administrative culture/administrative capacity to utilise public private partnerships (PPPs) in support of innovation/cooperation with local stakeholders due to risks of corruption.	**Threat 5** Level of competitiveness of local stakeholders in EU programmes is lower compared to stakeholders in other EU countries.
W1 RRI keys and AIRR dimensions are not formally set in internal documents	Revise current internal protocols and policy making guidelines to include RRI-AIRR principles	Revise current policies to include measures for inclusion of the target groups in public advisory and consultation bodies			

W2. Hierarchical model of governance and decision-making is an obstacle to a more effective communication and cooperation with stakeholders	Involve more actively in policy making the advisory and consultative bodies at the municipality; set up new ones if needed	Introduce digital tools for communication between municipality and citizens/stakeholders	Plan measures to reduce top-down decision-making and promote bottom-up communication and initiatives		
W3. Insufficient administrative culture /administrative capacity			Build internal capacity of the municipal staff through training programs		
W4 No realistic action plans and sufficient funding for policy implementation		Revise policies to include realistic and achievable KPIs and feasible sources of funding	Seek cooperation with national authorities to identify funding programs in support of policy implementation		
W5 Lack of synergy between systems (investment, sectoral policies, technology, etc)			Improve the coherence of administrative systems through regular periodic review of their work and achievement of KPIs		
W6. Lack of capacity to manage cooperation with external stakeholders (misunderstood as corruption risk)		Set up new and support the functioning of the existing stakeholder advisory ad consultative bodies working with the Mayor of Sofia			

Identification of strategic policy priorities

Based on the SWOT/TOWS analysis and focus groups, the following strategic policy priorities, in which the RRI-AIRR approach would best fit, are identified.

Strategic policy priorities can be clustered in the following five groups:

1. **Institutional framework**: municipal bodies responsible for strategy implementation.
2. **Strategic policy framework**: alignment of the municipal strategies (*Digital Transformation Strategy for Sofia, Youth Strategy 2017-2027, Innovation Strategy for Smart Specialisation of Sofia, Vision for Sofia 2050, Education Strategy 2016-23*), with national and EU-level strategic and programming documents.
3. **Capacity building** for RRI and AIRR-based territorial governance model and promotion of multi-actor and multi-stakeholders alliances supporting RRI-AIRR.
4. **Communication and engagement** with citizens and stakeholders.
5. **International learning** and cooperation with stakeholders at local/national/EU level.

Furthermore, several cross-cutting priorities/sectors for intervention have been outlined, as follows:

A. Internal (municipal administration, municipal procedures, etc.)

1. Improving the policy development, assessment, reporting, and evaluation process through stakeholder participation.
2. Building the capacity and skills of the administrative staff for better understanding RRI-AIRR .
3. Developing internal guidelines /protocols for applying RRI-AIRR in strategic planning and programming; it is essential to define an operational protocol for the effective engagement of the different categories of stakeholders and to foster their collaboration.
4. Developing a data policy to manage in a coordinated way the collection, access to, analysis, sharing, storage of data (required for policy making, public services, etc.)

B. External (related to stakeholders and citizens)

1. Communication with stakeholders: optimize communication by using a variety of channels, further develop and promote digital tools (accessible and adapted to the needs of various groups of society). Regularly provide information to key stakeholders to build their capacity in the field of RRI-AIRR and the relevant policy areas.
2. Introduce new or expand existing funding programmes to implement activities in support of RRI-AIRR principles.
3. The sustainable use of resources/circular economy principles has to be made a horizontal priority in each strategic policy area. Citizens and stakeholder need to be engaged in activities and campaigns for adopting green and sustainable living, for reducing air pollution, mitigating climate change, enhancing resource efficiency.
4. Close cooperation with the media to provide visibility and publicity to the achievements of science and local innovators, in order to garner public support for innovation policies.

Below are presented the key strategic priorities relevant to each policy area. As several of the survey documents (youth strategy, innovation strategy) are up for update and revision, results and know-how from the RRI-LEADERS project will be used to incorporate RRI-AIRR principles in the new documents.

Policy area SUPPORT FOR INNOVATION

1. Citizen participation in policy making is streamlined, efficient and easily evaluated through the use of digital technologies.
2. Building expertise for developing and implementing innovations in the public administration sector.
3. Focus long-term planning and programming on green technologies and developing human capital for industry 5.0 (including health and biotech industry).
4. Encourage innovations for city governance through open data policies and involvement of the industry in developing innovations (b2g, g2b, data-as-a-service, etc.).
5. Open up the innovation ecosystem of Sofia to neighbouring cities and to the region.

The proposals can be implemented through specific measures included in the annual Action plans for the implementation of the Innovation Strategy for Smart Specialization of Sofia. Public engagement measures/inclusiveness/anticipatory governance principles can be supported through the municipal funding program for social innovations (calls for proposals are published annually).

Policy area SUSTAINABLE URBAN DEVELOPMENT

1. Integrate sustainable development principles into all sectoral policies, in order to improve the quality of life in the city and municipality.
2. Climate change adaptation, clean air and smart transport are critical for the future of the city.
3. Increasing the competitiveness of the municipality and developing the knowledge economy, setting up new mechanisms for incubation and financing.
4. Integrating the RRI-AIRR principles as horizontal priorities in all of the municipal funding programs.
5. Support open experimentation and living lab initiatives, transforming the city into a test bed for innovative green & digital solutions to emerging societal challenges.

The priorities can be implemented through measures included in the Action plans for the *Programme for Sofia 2030*.

Policy area YOUTH EMPLOYMENT AND ENTREPRENEURSHIP

1. Introduce new opportunities for education and entrepreneurship in the municipality through better networking among stakeholders.
2. Involve young people in advisory and consultative bodies at the municipality in order to facilitate regular input and feedback on youth-related policies and measures.
3. Further support the innovation ecosystem, through programs for start-ups, tech and social innovation; open programs to people with migrant background.
4. Develop education and employment programs attractive to young people, in order to stop the brain drain and retain young talent in 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.

Policy area DIGITAL TRANSITION AND NEW SKILLS

1. Adopt a centralized approach for digital transition, consolidating infrastructure and resources across the entire administrative ecosystem based on open (data) access, ethical use of data management, inclusive and reflexive governance.
2. Ensure public (e)-services are adapted to and meet the needs of people with disabilities in line with EU directives.
3. Strengthen the role of Sofia Municipality as end user/client of local ICT, R&I companies, to foster product experimentation and development of digital products and solutions for the public sector.

4. Initiate public debate and adopt strategic guidance on the ethical use of AI in technology, research, and public services.
5. Develop 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, etc.

These proposals are partially or fully in line with the DTSS and can be implemented by the InnovativeSofia unit (in charge of the DTSS). In addition, the municipality (through InnovativeSofia) is part of several ongoing international projects (*PolicyCloud* under Horizon2020, UIRC – International Urban & Regional Cooperation, funded by the EC, Bloomberg Philantropies), which aim to accelerate the digitalization of the municipal administration and public services through big data analytics.

Summary of focus group discussions

In November and December, 2021, four focus groups were held: one with representatives of policymakers, one with NGOs, one with the business, and one with academia. Focus group participants were asked to address the following questions:

- What is your vision for the development of your territory in the chosen policy area(s) by 2030 (2050)?
- What is the transformative change that your territory should go through to achieve this vision? Which are the strategic policy priorities stemming from the vision?
- How the RRI framework, or individual RRI keys (public engagement, open access, gender equality, science education, ethics) could support the process of transformative change?
- How the integration of the AIRR dimensions (anticipation, inclusiveness, reflexivity, responsiveness) could support the process of transformative change?
- How do you perceive the role of *science/business/policy makers/civil society and citizens* in the process of this transformative change for achieving the identified policy priorities?
- Recommendations for integrating the RRI keys and AIRR dimensions in the identified strategic policy priorities.

Main conclusions from the discussions (all groups)

All stakeholders pointed to a commonly felt need and desire to push for institutional change towards **more responsiveness, communication, more and better involvement of stakeholders** and much more emphasis on **continuous experimentation** and **capacity building across institutions** and organisations in order to improve policymaking and implementation.

There is an agreement among the **policymakers, NGOs, and academia**, that the RRI-AIRR approach would **improve the inclusiveness** and relevance of policies, that is, to be more responsible vis-à-vis what society regards as desirable outcomes and results of municipal governance. Focus is placed on increasing the societal relevance of funding and investments, open access instruments/open data, digitalization of services and administrative procedures, innovation for sustainable urban development, cohesion, etc.

The need for **guidance for policymakers on how to do RRI** was identified by all groups. There is need for a clear and common understanding of what is meant by RRI and how to communicate it. **Policymakers** specifically mentioned that RRI-AIRR principles need to be set in municipal protocols/guidelines, but have to be tied to the achievement of specific objectives per policy area. **Industry and business** specifically mentioned the need to make RRI clear and concrete in their terms – in particular about the commercial gains to be made from this approach. By focusing on attracting new minds and new stakeholders into the R&I process as well as becoming more responsive to changing societal needs, RRI unleashes currently untapped potential in society.

All stakeholder groups ranked the **potential for developing better networks and cross-stakeholder collaboration** as a key opportunity stemming from RRI. NGOs, policymakers and researchers see value in RRI facilitating collaborations among them, emphasizing how these may generate better innovations, better science, and better opportunities for youth entrepreneurship. **Researchers** noted that collaborating with end-users may lead to the discovery of new research areas and questions, and subsequently improve the impact of science, whereas **NGOs** noted that collaboration may help scientists become more aware of the bigger picture in society; some NGOs have policy-specific expertise or expertise linked to one or more of the RRI keys, which neither academia nor policymakers have fully utilized.

Business and Policymakers specified that RRI might foster **greater competitiveness and creativity** within the R&I ecosystem. Even though many companies are not familiar with RRI, **business** representatives view it as a way to create new commercial opportunities by improving business understanding of consumer demand (based on **open data**), putting end-users (including the municipality) at the heart of the innovation process, and stimulating RRI processes in collaboration with research. Companies have already undertaken activities in line with RRI, albeit using different terms (e.g., sustainable innovation, participatory design, open innovation, stakeholder dialogues, scenario development, circular economy, risk assessment). Policymakers emphasized the potential for RRI to improve policy decisions around R&I, as well as **highlighted the value of dialogue and communication in increasing trust in society.**

The **political and institutional commitment of leaders** and managers is structurally one of the **key factors in the institutional change processes** which could transform the governance models in Sofia Municipality and stimulate uptake of RRI-AIRR . Participating groups agreed that the nature of RRI-AIRR as a conceptual approach aimed at actors' reciprocal responsibility, defines a space for innovative forms of governance centred on the adoption and the practical implementation of (self-) regulatory instruments such as codes of conduct, guidelines, technical standards, and audits.
Institutional framework: 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 in order to facilitate change towards mainstreaming RRI-AIRR .

RRI-AIRR approach rewards long-term thinking in innovation by enabling society to reflect, rethink and reshape the system over time. This was viewed by **policymakers** as particularly important in light of contemporary challenges and health crises such as the COVID-19 pandemic. Both **policymakers and NGOs** commented on the opportunity, from RRI, to focus more attention on inclusive programming and financial sustainability, fostering environmental awareness in society and particularly amongst young people and business investors, as well as to develop new ways of valuing the social impacts of research and innovation (esp. with regard to vulnerable groups).

Coordination and network building were seen as important for learning under RRI-AIRR , and some participants identified particular structural opportunities to enable networking and partnerships, including the importance of role models (for youth entrepreneurship), developing a platform that brings policymakers, science, and industry together. Further, **researchers** noted the importance of taking advantage of **scientific networks to foster cross-country learning** and utilize ongoing and future programmes at EU level (i.e. Horizon Europe) which aim to promote innovation and support for emerging technologies.

All participants agreed that **transparency, inclusiveness and visibility** are part of the philosophy of RRI and AIRR and, at the same time, they are preconditions for developing effective measures aiming to integrate RRI-AIRR in the operations and management of the organizations.

FOCUS GROUP WITH REPRESENTATIVES OF UNIVERSITIES AND RESEARCH ORGANISATIONS

Participants in the group included university professors and researchers, with experience in all four policy areas.
Concerning the policy area **support for innovations**, most participants agreed that **priorities** should include **green innovations** and those linked to **digital transformation of public systems**. This process should be led by research institutions and academia, as well as the business, while the role of civil society is to identify the issues and generate demand for solutions which meet current societal needs and challenges. Equally important is the inclusion of all stakeholder groups, following a **quintuple helix** model; in this respect urban **living labs, policy sandboxing** and other forms of experimentation need to be encouraged.

Among the identified **barriers** are market conditions supporting the innovation process, well-trained personnel, esp. in SMEs, as well as a robust regulatory framework (both at national and local level) and new procurement procedures; for example, pre-commercial procurement could facilitate the process of early uptake of innovation products. According to the group, there is potential for boosting innovations through collaboration between 4-helix stakeholders. **Media** is identified as a key actor since media disseminate information to society; well-informed citizens can participate in the process of problem identification and support scientific research and innovations. So-called **hidden innovations** also need attention and publicity, as they can drive the R&I process forward.

Push factors for RRI-AIRR adoption: The COVID-19 pandemic has become a main driver for innovation and digitalization; public institutions, research, the industry should use the momentum and push for new measures in this respect. Transformative technologies, data gathering, sharing and data governance have gained even more importance, and state and local governments play a key role for support of **innovations, the use of artificial intelligence, and development of personalized data services (data-as-a-service). Access to data and open data** are essential for the process of innovation and digital transition, but while public bodies are required to provide open access to data, they are not – yet - good in developing public services.

With regard to strategic priorities for **digital transition,** data are needed also for making possible socio-technical transitions, for example, creating **smart data platforms**, which integrate multiple public service systems (transport, energy, utilities, etc.). Such platforms can mobilize/incentivize both industry and citizens to take part in the design and implementation of such systems. On the other hand, there is a clear dependence between digital skills competencies of the staff and capacity for innovation of the business; digital tech companies are more prone to pursue and introduce innovations.

Participants also noted that a **generational shift** is taking place, with more young people taking high positions in office; this process could accelerate innovation, research, and digitalization. At the same time, huge disparities still exist in digital skills competencies across different social groups, esp. marginalized ethnic groups, which could slow down digitalization and leave people out.

With regard to policy area **youth employment and entrepreneurship,** participants noted that less attention is given to opportunities for **informal/non-formal education** through which young people gain important digital skills. Sofia has a huge potential to develop as a center of the gaming industry, and the capacity of people engaged in the industry, incl. gamers, has to be better utilized. 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 (digital) solutions in key public systems (transport, health, etc.) The support of civic entrepreneurs requires the creation of dedicated places and processes whereby different players can collaborate to let emerge, define and experiment ideas (e.g., spaces like SofiaLab, which is a member of the ENoLL network of living labs).

Sustainable development: Transforming the city into an open living lab for experimentation and digital/green entrepreneurship could be a long-term vision for Sofia, with relevance to all four policy areas. **Youth employment and entrepreneurship objectives** should cater to the needs of young people which are mobile, motivated, adaptable, adjusting also policies for informal, non-formal learning and recognition of skills. While many initiatives are available for entrepreneurship training most are geared towards the early stage of entrepreneurship, whereas the focus should be on how to sustain the business and remain competitive.

Role of RRI-AIRR dimensions:

- **Public engagement and science education** were noted as very important for innovations; the role of media is not less important as it makes possible the communication of science and research to the public and to policymakers. It is important to **raise the profile of researchers and academia**, to improve their public image, in order to build trust in science (through events such as Night of Researchers, Science Festival).
- **Gender equality**: it was stated again (as in previous focus groups) that this is not an issue for academia; women are well represented but the salaries of researchers and professors in universities are still very low compared to other professions. Considerations of work-life balance need to be taken in all policy areas.

Role of academia in the process of integrating RRI-AIRR in territorial governance: Universities and research organizations provide long-term insight into the future through their research. They can help with defining the long-term agenda of society in various fields of science and technology development. In this respect the focus group participants generally support the idea of having a special unit in the municipality responsible for research and science but this unit should work together with other (permanent or *ad hoc*) science and research panels which can advise on specific issues.

FOCUS GROUP WITH POLICY MAKERS AND REPRESENTATIVES OF PUBLIC INSTITUTIONS

The focus group brought together representatives of public institutions from local government, national agencies, as well as representatives of the EU Committee of the Regions. Key words in the discussion were **leadership, innovation, leading-by-example, e-government, responsive and anticipative governance,** capable to foresee risks and manage crises swiftly and efficiently**.** The vision for Sofia in the next 20-30 years is for a city which experiments, tests, innovates, in which citizens are active partners of the administration. The innovation ecosystem is built to ensure a sustainable green and digital transition into the future. In order for this vision to become reality, a change in mentality and dedicated political leadership is needed. Capitalizing on its competitive advantages, Sofia can become a model for other cities in the country as well as in the region.

Policy area support for innovation

Similar to the other focus groups, participants proposed priorities that dealt with a) seeking **alignment between local, national, European priorities** for innovation while focusing on the city's needs; b) better communication and **collaboration mechanisms between the helix partners**; c) consistent efforts to make the impact/**effects of innovation visible to the public**. These priorities can be achieved by further improving and **building up the administrative capacity** of the municipality. A special fund for social experimentation/innovations could be established to support innovative solutions. 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.

Policy area digital transition and new skills

Participants unanimously agreed that **digitalization of administrative procedures, e-government and public e-services** should be on top of the local government's agenda. 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, group participants proposed solutions (most of which are already being implemented within the digital transition strategy of Sofia), such as building a **platform for data exchange / open data** accessible to public and private companies.

A high priority is **improving the digital skills of the administration** and the citizens through re-skilling and upskilling programmes for all ages. Launching a **public debate on what transformative technologies hold for the future**, including the use of AI in different applications is also needed. It was pointed out that digital technologies clearly impact on the administration's ability to **respond and adapt** to changing societal needs**.**

Policy area sustainable urban development
For the policymakers, the main focus in the foreseeable future should be **on air pollution, smart transport and alternative mobility solutions, and curbing urban sprawl**. Citizens should be mobilized to adopt responsible consumption and circular economy principles. This could be achieved by funding **small pilot projects** (initiated by citizens, 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 such as in- and out-migration, an ageing population, the EU regulatory and financial climate (through the Multi-Annual Financial Framework) will have a major impact on various systems in the city (e.g., education, labour market, housing, healthcare, etc.).

Policy area youth employment and entrepreneurship
Participants pointed out several long-term priorities for the city in this policy area, which largely coincide with those proposed by the other focus groups. These include a) ensuring citizen participation in strategy development; b) introducing dedicated funding instruments for initiatives of young people; c) design flexible employment policies built on forecasts of labour market needs; d) include young people in policymaking through consultative and advisory bodies; e) widely communicate policy objectives to young people, so they know how to engage. Science communication is important, in order to make research and academia more attractive to young people and to retain talent in the country.

With respect to the role of the **5 RRI keys**, participants noted that **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 – including institutional, human, and financial resources – so they 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, instead of maintaining a heavily bureaucratic administration, with rigid hierarchical decision-making systems.

Participants discussed the feasibility of establishing a **city science office** and appointing a chief scientific officer (based on the UK model) in an effort to create an institutional ecosystem steering the relationship between science actors, local communities, socio-economic actors and city government. There was general support for the idea which can be a good delivery mechanism to experiment, prototype, and scale-up innovative and entrepreneurial initiatives. Other participants commented that such an office/position will need support from other administrative units in order to coordinate vertical and horizontal urban policies, research and innovation.

All participants agreed that **public engagement** is a crucial factor for gaining support to policy measures, in all stages of the policymaking process, from needs assessment to evaluation. The methods of engagement should reflect the specifics of the policy topic and the socioeconomic characteristics, including gender, of the concerned target groups. Concerning **gender equality**, the group thought that it should be understood more broadly as ensuring **diversity in representation** and **inclusion of all** groups in society. A more acute problem for Sofia and the country is the **worsening demographics,** the **ageing** population and continuing **brain drain**. Policies, esp. youth policies, should therefore prioritise measures to stop the brain drain, retaining young talent, and offering competitive opportunities for living, studying, and working in the capital city.

Regarding **open access to data** policymakers agreed that it is important for shaping research and innovation; it is also needed for transparent decision-making, but at the same time, IPR needs to be observed. Open access must be granted for any data that has been produced using public money. Many times private and public interests do not align in terms of how data are harvested, processed, shared, etc., as data is becoming a very valuable currency and local governments need to strike a balance among conflicting interest groups. E-government relies on data being gathered and shared in a coordinated way among different institutions and levels of government, which requires a strong leadership and consistent efforts. Participants proposed that a dedicated unit in the municipality is established tasked with the realization of e-government. The recommendation was also for following a centralized **open data policy**, making sure that the interests of public institutions are protected against big companies which use data for commercial gain.

FOCUS GROUP WITH REPRESENTATIVES OF CIVIL SOCIETY AND NGOs

Discussions began with the question whether NGOs should be expected to have a vision for the municipality and the policies to be developed. NGOs can propose various initiatives to aid the policymaking and test potential solutions, but it should be within the remit of the administration to propose a comprehensive vision for the city's future. On the other hand, strategic documents are still written in an administrative jargon which averts citizens or NGOs from active participation. NGOs are the link, translating the policy language to citizens, enabling communication and cooperation among stakeholders.

For this group, strategic priorities in the area **support for innovation** cluster in three groups: a) building **infrastructure for innovation** support, such as hubs, incubators, accelerators, and offering financial support for the implementation of projects; b) **citizen participation** in defining a strategic vision for the city, including through citizens budgets; c) building capacity for developing and implementing **innovations in city governance.** Sofia Municipality could utilize more efficiently the expertise and experience of the civic sector by commissioning studies conducted by experts from the NGOs.

With regard to **sustainable urban development**, the strategic priorities concern: a) facilitating more effective access and communication between citizens and the administration, through special contact points in each district administration; b) infrastructure that is accessible to all citizens; c) curbing urban sprawl and regeneration of abandoned areas, esp. in the city periphery; d) improving public transport and air quality; e) using digital tools to discuss plans for public infrastructure and reconstruction of public spaces.

In the area of **youth employment and entrepreneurship**, discussions focused on the following priorities: a) establishing new or improving existing programs for entrepreneurship, through mentoring and expert support from the business; b) regular reviews and forecasts about labour 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) integrate new measures in municipal youth policies that account for gender dimensions of employment and skills in a digital environment.

Priorities in the area of **digital transition and new skills** include: a) introducing e-government and public e-services; b) improve digital skills of the municipal staff; c) continue to follow an open data policy. The role of NGO can be to offer training for digital skills, in particular to elderly citizens, marginalized groups, to ensure that they are not left behind in the digital transition. Participants in the focus groups reiterated an opinion already shared by NGO in previous surveys, namely, that civil society must be included in the monitoring, impact assessment and control of policy implementation.

As concerns RRI-AIRR principles, according to the group **public engagement** has a consultative role and provides expertise for defining long-term priorities. Secondly, public engagement is important for monitoring, evaluation, and control of policy implementation, and thus improving accountability and

transparency. Thirdly, public engagement creates a sense of shared responsibility, solidarity and trust in public institutions. **Open data policies** are considered prerequisite for a quality research process and 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. In policymaking, ethics implies also responsibility to future generations. With regard to **gender equality**, some participants expressed the opinion that both genders are treated equally in Bulgaria. A renewed understanding of gender equality is needed to provide a more encompassing perspective to policies in terms of inclusiveness, promoting diversity, and ensuring a place for all social and ethnic groups in policy implementation.

With regard to **AIRR dimensions,** participants agreed that practically all four principles are applied even though they are not formally described in the AIRR terminology. **Self-assessment and reflexivity** depend on a regular review of the available data, therefore, it is crucial for the administration to ensure that data used for analysis and policy initiatives are correct. In this respect, NGOs and the administration could join forces in conducting **foresight studies** which could be integrated in the programming process.

FOCUS GROUP WITH BUSINESS REPRESENTATIVES

The focus group with representatives of the business followed the same structure as the rest of the groups. Their opinions largely coincide with those of the other three groups. In terms of priorities, in the policy area **support for innovation**, they placed the focus on closer collaboration with the business in defining a long-term vision for a smart and innovative city, within a 10-15-year timeframe. According to the business, important priorities in technology development fields for the city should also include biotechnology and medical sciences. Reducing the administrative burden on SMEs and full digitalization of the SMEs was also listed as important. Priorities in **sustainable urban development** need to focus on limiting construction and improving the living environment, building new green spaces and parks. Energy efficiency of buildings and using green technologies for construction is also seen as important. Constructing modern industrial zones should be planned as low-carbon zones. Overall, participants agreed that long-term urban planning should involve the business, taking into account also future transformations in the industry and the respective impact on the education system and the labour market.

With respect to **digital transition,** the participants highlighted the following priorities: a) e-government, e-services for citizens and businesses; fully functional e-administration; b) training and skills building programmes for new digital future, which can be implemented jointly by the business and academia. Cybersecurity and building a resilient digital infrastructure was mentioned as an important priority as well. Concerning **youth employment and entrepreneurship,** the participants proposed to focus on developing digital/hybrid learning models, which can be taught outside the school. Encouraging university education in STEM, internship programmes for young people in the municipality/municipal enterprises/joint projects with municipal schools for entrepreneurship were also mentioned. According to the business, the pandemic has stressed the need to support young doctors/medical specialists, esp. those willing to work in municipal hospitals (e.g., through tax deductions, housing allowances, etc.). Holding annual meetings business-academia to define priorities in the labour market on the territory of the city are also recommended.

According to the focus group, in order for the priorities to be achieved, **several transformations are needed: a)** the management and implementation of policies has to change, by including more actively the business and other stakeholders through consultative/advisory bodies; **b)** more private-public partnerships and regular meetings between the local business and local government could facilitate uptake of innovations in all spheres of public life; **c**) increased funding for business-led initiatives in support of policy objectives was ranked third in importance.

Regarding the RRI-AIRR dimensions, the opinions of the focus group were as follows**.**

- **Public engagement** is important to utilize the expertise of the business (and other stakeholders) on various topics; it is a way to address better the needs of citizens and to motivate them to participate in public projects. Citizens need to know how public money is spent; lack of transparency increases the perception of corruption which impacts negatively the process of transformation. Therefore, informing and engaging the public increases citizens' trust in the administration. There were also negative opinions, arguing that the administration "does not care" what the public thinks.
- With respect to **gender equality** the respondents' opinion coincides with that of the other groups: it does not seem to be an issue in Bulgaria and it is not a barrier to strategic transformation. That said, it is necessary to respect diversity and differences between genders and generations.
- **Science education** is considered very important, esp. for research and innovation in high tech fields. According to participants, there is direct correlation between science education and the levels of innovation, the number of young people starting careers in science/academia. Science education and better awareness of scientific breakthroughs implies capacity to adequately assess future needs and priorities, and making informed decisions and quality input to policymaking. The focus group participants also emphasized the need for scientists and researchers to communicate more effectively their work to the public; businesses need to have R&I units, and so does the administration.
- Concerning **ethics** most respondents understand it as prevention of corruption and basis for responsible, accountable, transparent governance. Ethics means professional responsibility; it is foundational for a fair businesses environment and well-functioning public administration.
- **Open access:** for the participants, open access and open data are drivers of collaboration, sharing of knowledge, transfer of ideas and good practices among actors of the research and innovation ecosystem. Open access enables experimentation and drives forth scientific progress; at the same time, innovative commercial products have to be protected by IPR. The municipality could negotiate with the business which data are open access and can be used for designing new public services.

With regard to **AIRR** dimensions, according to the participants **anticipatory** governance is most important for successful policy making; **responsiveness** was ranked second; followed by inclusiveness and reflexivity. In their opinion, the municipal administration has the least capacity for anticipatory governance; inclusiveness is also a weak aspect of the administration's work; responsiveness and reflexivity were assessed as relatively well integrated in policymaking. In this respect, local government can learn a lot from the business: for example, by adopting idea generation models, flexible management practices, being more focused on the client's needs, adapting more quickly to new circumstances, better management of financial capital and public expenditures.

Participants also discussed the **roles of the quadruple helix partners** (science and research, business, NGOs, policymakers) for the integration of RRI-AIRR in territorial governance.

- **Science/academia** are primarily responsible for providing knowledge-based input relevant to policymaking in key urban systems (health care, social services, digital transition). The scientific community however needs to open up more and collaborate with the other stakeholders. Science leads the way into the future, creates the vision for the city to follow.
- **The business**, on the other hand, produces know-how, knowledge, services, and products, and much of the revenue in the municipal budget – therefore it has the right to monitor how money is spent. In the process of transformation, businesses can sponsor the implementation of certain policy priorities, in collaboration with academia and NGOs. The business can also drive forward experimentation, by being early adopters and innovators. Many joint projects can be carried out through private-public partnerships.
- When it comes to the role of the **civic sector**, NGOs are mostly seen as an intermediary between citizens and the administration; they can facilitate public engagement and ensure inclusiveness, esp. of

vulnerable groups or groups with special needs. Secondly, NGOs play a key role for **monitoring, control of implementation, and assessment** of policymaking and implementation.

- As concerns **public bodies and local government**, they were unanimously identified as the leaders of transformation: from launching public debates on which digital technologies and innovations are most needed to society, to creating a favourable environment for research and innovation through an enabling regulatory, financial, and communication framework. Responsible leadership is the key to building a vision for the city and achieving it.

The recommendations of the group on **how to integrate RRI-AIRR in the four policy areas** largely repeat those made by the other focus groups. Emphasis was placed on regularly consulting with citizens and stakeholders on defining policy priorities and their implementation; carrying out joint projects and collaborative actions; using digital platforms for collaboration and communication, etc. Specific recommendations dealt with providing tax reliefs or other incentives to innovative businesses on the territory of the city; incentives for businesses investing in young people and programs for retaining local talent; creating and nurturing a well-networked ecosystem of innovators; promoting local services and products which improve the well-being of people and the living environment in the city.

Policy recommendations and conclusions

The following recommendations are formulated based on the document analysis, interviews and focus groups. The **first group** of recommendations concern the institutional framework and collaboration among stakeholders; the **second group** includes recommendations for each policy area.

Group 1 Recommendations on institutional framework and stakeholder collaboration

1. Including RRI and science-based policymaking in the organisational standards and practices following a whole-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 to adopt a mainstreaming approach, i.e., an approach which considers RRI and AIRR as a framework influencing all the aspects of governance and functioning of the municipal administration (procedures, structures, norms, culture, motivations) as well as all its functions (e.g., strategic planning, investment, etc.)
2. Organising innovation**.** The municipality has to pay a structural attention to innovation, so that the results of research can be integrated into existing administrative units and policies. This can be done by setting up a municipal-wide R&I team or a team that is distributed across different management boards.
3. Strengthening city research capacity: Developing urban regional research ecologies that interact, reflect and act together is necessary for handling the emerging accelerating and accumulating crises. Ensure good structural and administrative support for stakeholder collaborations so they can survive partisan politics shifts.
4. Including evaluative measures into the governance framework: specific metrics and indicators adaptable to the specific 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.
5. Rethink and redefine principles of gender equality, taking into account various gender dimensions of policy impact, generational differences, minority groups, intersectional discrimination, etc.

Group 2 Policy-specific recommendations

Policy area SUPPORT FOR INNOVATION

1. Recognising 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 new knowledge and tech transfer processes (municipal incubator, pre-commercial procurement) that enable civic players, young people, citizens, local start-up and SMEs to become promoters of new solutions to societal goals.
3. Financial instruments should allow more space for research that is relevant to local challenges. Also, having a single point of contact for research cooperation in local government can contribute to more effective collaboration between academia and public bodies.
4. Developing new public procurement procedures (incl. such for pre-commercial procurement) which include RRI keys and AIRR dimensions and facilitate uptake of innovation results in urban systems.

Policy area YOUTH EMPLOYMENT AND ENTREPRENEURSHIP

1. Students as representatives of future generations not only change city life, they also have a deep impact on research and innovation. To make sure that new generations can enter into this ecology and contribute with their specific engagement and expertise, the city needs to offer new programs for employment and internship. 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.
2. Transforming the city into an open learning environment and encourage student-led experimentation through living labs and co-creation formats.
3. Developing flexible programs with academia & business to recognize skills and competencies acquired from informal/non-formal learning, in order to retain local talent.

Policy area SUSTAINABLE URBAN DEVELOPMENT

1. The city administration should put more emphasis on innovation and experimentation, including by building an adequate administrative system for organising and governing the innovation process.
2. Enable (through facilities and funding) collaborations between research, industry and NGOs and build living labs as a space for co-creation, incubation, acceleration of local economy solutions, offering neighbourhood-based community-owned services and infrastructure.
3. Transform the city itself into an experimentation “playground”, promoting the interaction among citizens, policymakers, researchers and experts in-field to explore and tackle together key societal challenges. Citizens can become the vehicle for design, approval and validation of solutions and good practices that are transformed into concrete policies.
4. Initiate own/support external projects in fields linked to the policy areas to take advantage of available EU funding for urban development.

Policy area DIGITAL SKILLS

1. Continue the implementation of the municipal Digital Transition Strategy for Sofia.
2. Initiate and coordinate digital transformation policies, to reduce the administrative burden, to develop and implement e-services for the citizens and businesses in Sofia, open data platforms and smart city projects.
3. Include young people, NGOs and start-ups in the process of training/reskilling/upskilling of people from various ages.
4. Promote business models (and public-private partnerships) that can sustain the digital transition of the city in public services.
5. Prioritise local business/technology sectors for funding (through Municipal Guarantee Fund, SofiaInvest, etc.) to achieve policy objectives.

Conclusions

This report presents the findings of the RRI territorial audit for Sofia Municipality. Based on document analysis, semi-structured interviews and focus groups with more than 80 representatives of the quadruple-helix partners in Sofia, review of the institutional and policy framework in the four policy areas (*support for innovation, digital transition and new skills, sustainable urban development, youth employment and entrepreneurship*), the report gives an overall positive assessment of the extent to which an RRI-AIRR framework is integrated in policymaking and implementation. The audit has clearly shown that embedding RRI principles into territorial development policies and urban planning tools is not a one-way and linear process, but requires careful orchestration of the trajectories of multiple actors and governance levels. Specific recommendations, derived from the analytical studies and the focus groups are formulated to aid local authorities in the process.

While the municipal administration is yet to take full advantage of RRI-AIRR in order to address the complexity of the interplay between science and society, especially as it affects territorial development, many of the local stakeholders involved have strong experience and are willing to share it with the city. As evidenced by the focus group discussions, purposefully or not, some municipal units have already adopted planning instruments that incorporate RRI, generating effects on the urban level. Cases linked to the implementation of the smart specialisation strategy of Sofia, the digital transition strategy, and individual city-level projects, reveal a number of elements that are sustainable, open, inclusive, anticipative and responsive in the city strategic planning (such as public engagement, open access/open data, gender aspects). In those cases administrative codes of practice, internal guidelines, organisational and functional structures are also in place. Open access has been promoted as a core mission by all stakeholders, and it is recognised as the main driver – but also a prerequisite – of open science and open innovation practices. The audit indicates that ethics, RRI governance and science education are dimensions that can be included in the policy instruments.

Results of the focus groups and document analysis provide the municipal authorities with a baseline to improve the integration of the RRI-AIRR approach in their commitments to develop self-sustaining research and innovation ecosystems, which can successfully address societal challenges for a common benefit. For most of the experts and stakeholders involved, RRI emerges as a potentially effective solution to ensure smart, sustainable and inclusive growth in a post-COVID society, a chance to restore the public confidence in science and innovation, and a novel way for policy-makers to argue the case for responsible, anticipatory, transparent governance. The audit report ends with policy-specific recommendations and strategic objectives to be included in the transformative outlook for Sofia Municipality (to be developed by the end of the project).

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