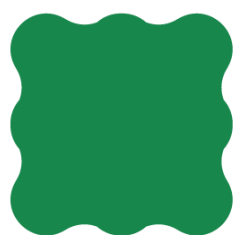


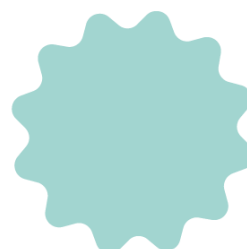
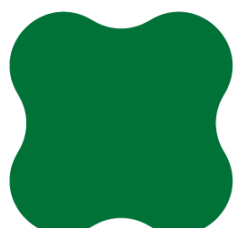
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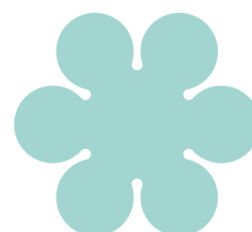
Open Science and Data Management Plan 1



Deliverable 7.4
23.12.2022



Creating
Actionable
Futures



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Document History

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23.12.2022	v.02	Dirk Ahlers, Alicia Takaoka, Letizia Jaccheri (NTNU), all partners	Integration of feedback, Updates on repositories and processes, addition of Open Science practices under the CrAft approach.

Table of Contents

Document Information	2
Document History	3
Table of Contents	4
Executive Summary	5
1. Introduction	6
2. Open Science Approach	9
2.1 Co-Creation and involving all relevant knowledge actors	9
2.2 Open Access to results and publications	12
2.2.1 Acknowledgements and licenses	13
2.3 Open Research Data and Open City Data	14
2.4 Open Source considerations	15
3. Data Management, Sharing and Open Access	17
3.1 Data Handling Descriptions	18
3.2 Access Rights and Procedures and IPR	19
3.3 Document Management	20
3.4 Archiving and Preservation	20
4. Ethics Considerations	22
5. Dissemination and Exploitation	26
6. Data Summaries	28
6.1 Data Summary template	28
6.2 Data Summaries	29
7. Conclusion	30
List of Acronyms	31

Executive Summary

This deliverable constitutes the initial Open Science and Data Management Plan (DMP) for the CrAft project. It specifies Data Governance and handling of data in the project in the form of initial project guidelines, what types of data are expected to be generated in the project, whether and how it will be made open and accessible for verification and re-use, how it will be curated and preserved, and details ethical, privacy, and security issues.

CrAft has a strong commitment to open innovation, co-creation, and a collaborative approach with a range of societal stakeholders and extensive knowledge sharing. Core results of the project will be created together with these societal stakeholders and relevant European initiatives and policy makers.

All beneficiaries are informed of the applicable regulations around human participation, informed consent, data processing, data security, and the pertinent regulations such as GDPR, Horizon Europe Open Science guidance, FAIR guidelines, or Horizon Europe Ethics Guidance. When personal data collection or processing is started, the DMP information will be updated accordingly to include updated data summaries, consent forms, compliance, and institutional approval where necessary. Processing of personal data will respect Data Protection Principles.

The project will support openness according to the EU principle "as open as possible, as closed as necessary" together with the project ambition of "Open by Default".

1. Introduction

This initial document develops the CrAft Data Management Plan (DMP) and details its Open Science approach and Research Data Management, including open access to research data, with all beneficiaries and WPs. It describes overall Data Governance in the project, including the lifecycle of data to be collected, generated, used, or processed within the project and the handling of data, including methodologies, data sharing, privacy and security considerations, legal and regulatory requirements, informed consent, open access, both during and after the project. This Deliverable is part of Task 7.2 Open Science and Data Management.

CrAft has a strong commitment to open innovation, co-creation, and a collaborative approach with a range of societal stakeholders and extensive knowledge sharing. Core results of the project will be created together with these societal stakeholders and relevant European initiatives and policymakers. Project and research results will be shared with societal actors and through relevant networks, as well as through scientific channels under an Open Science approach, including Horizon FAIR principles for data access. Results, data, and documentation will be made publicly and openly accessible to societal stakeholders, cities, and the public, to achieve the project's ambitions.

CrAft follows the principle "as open as possible, as closed as necessary" together with the project ambition of "Open by Default".

This document is based on the Horizon Europe Open Science strategy, namely on the summary¹:

Open science practices include early and open sharing of research (for example through preregistration, registered reports, pre-prints, or crowd-sourcing); research output management; measures to ensure reproducibility of research outputs; providing open access to research outputs (such as publications, data, software, models, algorithms, and workflows); participation in open peer-review; and involving all relevant knowledge actors including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science).

¹ HE Programme Guide: V2.0 – 11.04.2022, Section: Open Science, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

Dissemination of results and the project value demonstration are supported by Open Science measures of Open Access, Open Data, and Open Source. All public Deliverables and results will be freely published on the project website. The project will use open licenses for Deliverables, documentation, and publications. Creative Commons CC-BY4.0 will be the default. The project follows an Open Access (OA) strategy for all scientific publications arising out of the project. Each academic partner has a budget allocated for article processing fees. As a fallback, Green OA will be mandated through self-achieving in the university partners' institutional repositories. Where possible, venues with Open Peer Review will be preferred and preprints deposited. Additional results are expected to be published as Open Source or Open Data; IPR protection may be sought where relevant.

Data provided by the project will support a range of goals, such as improving dissemination and exploitation of data and results; improving access and reuse of research data; and knowledge sharing with citizens, the wider public, interested stakeholders, and the scientific community. Documentation and research data repositories will follow the Horizon Europe best practice, with a focus on open access, peer-reviewed journal articles, conference papers, and datasets.

The project aims to make research data findable, accessible, interoperable and re-usable (FAIR) in line with the EC Guidelines on FAIR Data Management. H2020 documentation is used until the HE documents are fully available. Data collected during the project will adhere to FAIR Principles for data collection and management. Our data will be Findable, Accessible, Interoperable, and Reusable². Data will be housed in a persistent repository. Data will also be assigned identifiers and described through metadata as best as possible. In addition, the project will try to use language that is easily searchable, translatable, and retrievable in adherence to catalogue, dataset, and distribution metadata layers. Finally, the project will maintain the integrity of the metadata after the data is unavailable in order to preserve the integrity of the datasets.

A publication process is implemented by WP7 as part of QA to ensure approval by project partners before knowledge publication, especially to safeguard IPR and confidentiality/data protection interests, as a refinement of Grant Agreement and Consortium Agreement.

The project is built around transparency and openness. 39 out of 41 deliverables are open, and only 2 are confidential, which is valuable support for outreach and replication. Deliverables are expected to be used both internally and externally, to both inform the project and its team members about activities and results, and to

² <https://www.go-fair.org/fair-principles/>

inform external stakeholders and potential collaborators and replicators. This means that documentation is written with a focus on usefulness for the project and the European Cities and other stakeholders.

In addition, CrAft aims to fulfil all ethical requirements and acknowledges that compliance with ethical principles is of utmost importance, especially regarding human participants and processing of personal data. Beneficiaries will ensure respect for people and for human dignity and fair distribution of the benefits and burden of research, and will protect the values, rights and interests of the participants. All partners are aware of the Horizon Europe Rules of Participation³ and the Ethics clauses in Article 14 of the Grant Agreement and the obligation to comply with ethical and research integrity principles set out therein and explained in the annotated Model Grant Agreement⁴. The project will respect the privacy of all stakeholders and citizens and will seek free and fully informed consent where personally identifiable data is collected and processed. Processing of personal data will respect Data Protection Principles.

NTNU will appoint an Open Science and Data Manager, in close collaboration with all beneficiaries and WPs, also on knowledge management and scientific validity of results. It will maintain and evolve the Data Management Plan (DMP) linked to the Open Science approach and ensure open access to research data.

This public document describes the status of the DMP at the time of delivery, December 2022. It will be refined by future deliverables of the DMP and updates in individual Work Packages. This document is based on the main formal project description of the Grant Agreement (101056946) and additional documentation built so far in the project. The Consortium Agreement of CrAft further details the Consortium Governance and relations of beneficiaries and IPR processes. Large parts of this document are further based on previous experiences of the Coordinator and the partners, in particular⁵ from the +CityxChange project⁵, as well as from the respective HE guidance.

³ [REGULATION \(EU\) No 2021/695 \(Rules for participation and dissemination in Horizon Europe\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0695&qid=1621434634235&from=EN),
<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0695&qid=1621434634235&from=EN>

⁴ EU Grants: Horizon Europe AGA – Annotated Model Grant Agreement: V0.2 – 30.11.2021 General MGA,
https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

⁵ [+CxC Deliverable D 11.5 Data Management Plan - Initial version](https://cityxchange.eu/knowledge-base/data-management-plan-initial-version/),
<https://cityxchange.eu/knowledge-base/data-management-plan-initial-version/>

2. Open Science Approach

CrAFt will generate and collect different types and forms of data. This includes reports, documentation, specifications, tools, workflows, methodologies, process data, city reports, and studies, to mention a few. Open standards are preferred, with agreement on compatibility between partners for any exchange. The project expects to use existing Open Source systems and make any own developments available under applicable open licenses.

The consortium will provide Open Data arising from the project where possible to support a number of goals, such as: improved support to European Cities, supporting Open Science, benchmarking with other projects; improving dissemination, contribution to other Information Systems and databases, exploitation of data and results; improving access and re-use of research data generated within the project; and knowledge sharing with cities, citizens, societal stakeholders, the wider public, industry, and the scientific community. Where possible, data will be made available through Open Data repositories of participants, or linked with publications.

We follow the HE guidance on Open Science principles:

Open science in Horizon Europe⁶

Open science is an approach based on open cooperative work and systematic sharing of knowledge and tools as early and widely as possible in the process. It has the potential to increase the quality and efficiency of research and accelerate the advancement of knowledge and innovation by sharing results, making them more reusable and improving their reproducibility. It entails the involvement of all relevant knowledge actors.

2.1 Co-Creation and involving all relevant knowledge actors

CrAFt follows open innovation, co-creation, and collaborative approaches with a range of societal stakeholders and extensive knowledge sharing, creating a bridge between science and practice to speed up the transformation towards climate-neutral cities across Europe creating actionable futures that are not only

⁶ HE Programme Guide: V2.0 – 11.04.2022, Section: Open Science, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

sustainable but also inclusive, empowering and accessible to all, with costs and benefits shared on the basis of social solidarity and justice.. Core results of the project will be created together with these societal stakeholders and relevant European initiatives and policy makers. CrAft embraces the driving values of the New European Bauhaus: Sustainability, Aesthetics, and Inclusion.

The Horizon Europe guidance on Open Science principles includes options for data collection and analysis from citizens using a citizen science approach. This project will stress the importance of crowdsourcing data and analysis and suggest gathering data using open science platforms like EU Citizen Science. Guidelines for developing unique data collection efforts using the pillars of open science may be developed. However, CrAft cannot mandate this for its reference cities, but it will be assessed in the relevant tools and guidance, and also focused on for the reference cities and the universities' work.

CrAft inherits from the New European Bauhaus a human-centred approach to achieving climate neutrality. In addition, CrAft develops, tests and shares local participatory governance models, as a means to accelerate adoption of climate-neutral measures at city level. Because CrAft actively engages policy makers, students, professionals in the cultural and creative sectors, and property owners in those participatory processes, a citizen science approach to data collection and data analysis are important factors in the CrAft framework.⁷

CrAft, based on the New European Bauhaus (NEB) and Horizon Europe, aims to integrate the human aspect and human scale into the transition and move beyond open access to open science. These NEB values and characteristics inform CrAft's Open Science strategy. Additional examples may include:

- Conveying the importance of citizen science to stakeholders
- Sharing citizen science platforms with stakeholders, be it from cities, universities, or European initiatives (such as <https://eu-citizen.science/>)
- Providing ideas for in-person citizen science activities
- Encouraging the development of participatory citizen science projects for municipalities and communities
- Describing crowdsourcing, participatory research, design thinking, and volunteer monitoring as possible citizen science endeavours
- Highlighting and providing examples of how citizens can be part of city transitions to climate neutrality

⁷ Taken from the CrAft Dissemination & Exploitation Plan 1 (D6.2), forthcoming

- Suggesting ways to create policy from citizen science initiatives and activities

This plan for prioritising citizen science is in alignment with the CrAft Diversity and Inclusion plan, which adheres to the CrAft values of being Beautiful, Regenerative, Resilient, Just, Inclusive, Sustainable, Diverse, and Climate - Neutral by 2030.

In the CrAft Diversity and Inclusion Plan, specific items for involving various stakeholders are included. They are:⁸

- Take stock of existing stakeholders and activities, map which stakeholders should be included in each activity, and how to engage beyond the usual suspects
- Identify how to support stakeholder-driven activities and/or how to co-create activities with stakeholders, building on their needs and priorities. Avoid organising activities that make people feel they merely contribute to a CrAft result with little in return.
- Discuss which instruments can be used to achieve this, using diverse methods such as workshops, focus groups, knowledge cafés, exhibitions, social media etc.
- Make information available in condensed form, non-expert language and visualised
- Create a shared vision and understanding with the selected stakeholders, clarify roles and responsibilities, and set priorities - to show that we use their time responsibly.
- Document how the journey works in practice in cooperation with observers, facilitators and visualisers before, during and after the activity, as part of the monitoring and evaluation routines of each Work Package (D7.3: CrAft M&E framework, forthcoming⁹)

These steps are critical for ensuring the representation of many voices in the creation of a city-centric transition to climate-neutrality by 2030.

⁸ CrAft Deliverable D7.2 Inclusiveness and Diversity Management Plan 1 (<https://craft-cities.eu/wp-content/uploads/2022/09/D7.2-Inclusiveness-and-Diversity-Management-Plan.pdf>)

⁹ CrAft Deliverable D7.3 CrAft M&E Framework (Forthcoming)

2.2 Open Access to results and publications

The dissemination activities within the project will include a number of scientific and other publications. CrAft is committed to dissemination and the principle of Open Access for scientific publications arising from the project, in line with the Horizon Europe's Open Science Policy¹⁰. It further aims to make research data open as described above. A budget has been set aside for the academic partners to support gold open access publishing. The Open Research Europe¹¹ publishing and repository platform will be assessed for use.

Publication of scientific papers will be encouraged by the CrAft consortium. For cases where it may interfere with seeking protection of IPR or with publication of confidential information, a permission process for publishing any information arising from the project is put in place in the Consortium Agreement. Notification needs to be given at least 30 days before the publication, with objections subject to the rules of the Consortium Agreement.

The project aims for Gold Open Access publication of scientific peer-reviewed papers where possible and will adopt a Green Open Access strategy as a fallback.

All universities have an Open Access strategy. At the minimum, this will include self-archiving of publications in known centralised or institutional repositories, or for example OpenAIRE¹².

Institutional repositories are:

- NTNU: institutional archive NTNU Open¹³
- UNIBO: institutional archive AlmaDL for Open Access¹⁴
- CVUT: Czech Technical University Digital Library¹⁵

¹⁰ Horizon Europe's Open Science Policy [Open Science](https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en) (https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en); Comparison of H2020 and HE: [Where is Open Science in Horizon Europe? | openscience](https://openscience.eu/Open-Science-in-Horizon-Europe) (<https://openscience.eu/Open-Science-in-Horizon-Europe>); HE Programme Guide: V2.0 – 11.04.2022, Section: Open Science, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

¹¹ <https://open-research-europe.ec.europa.eu/>

¹² <https://www.openaire.eu/>

¹³ <https://www.ntnu.edu/ub/research-support/open-access>

¹⁴ <https://sba.unibo.it/en/almaDL/almaDL-for-open-access/almaDL-for-open-access>

¹⁵ <https://dSPACE.cvut.cz/>

- AUAS: 100% open access policy via PURE database¹⁶

2.2.1 Acknowledgements and licenses

Authors will ensure appropriate bibliographic metadata is published as well, where possible. It will be in a standard format and include the terms "European Union (EU)" & "Horizon Europe"; the name of the action, acronym & grant number as below; publication date, length of the embargo period, if applicable; and a persistent identifier.

These requirements are also codified in Article 17.2 of the Grant Agreement on Visibility – European flag and funding statement.

Authors will aim to retain copyright and usage rights through open licenses, such as Creative Commons Attribution License (CC-BY 4.0¹⁷/CC-BY-SA) or otherwise publisher agreements to similar effect will be pursued. Project participants will ensure that all publications acknowledge the EU funding and the name and grant number of the project, including the standard disclaimer as also found on the title page of this document. Each paper should contain an acknowledgement text:

This work has been [partially] performed within the project CrAft – Creating Actionable Futures [footnote: <https://craft-cities.eu/>] that has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No. 101056946.

Deliverables are public by default through a Creative Commons CC-BY4.0 license. Other CC licenses may be applied after consultation.

The specific requirement for open access to scientific publications is also anchored in the Grant Agreement (Annex 5):

The beneficiaries must ensure open access to peer-reviewed scientific publications relating to their results. In particular, they must ensure that:

- at the latest at the time of publication, a machine-readable electronic copy of the published version or the final peer-reviewed manuscript accepted for publication, is deposited in a trusted repository for scientific publications

¹⁶ Open Access Strategy AUAS

<https://www.amsterdamuas.com/library/support/research/open-access/open-access.html>

¹⁷ Creative Commons License Attribution 4.0 International (CC BY 4.0)

<https://creativecommons.org/licenses/by/4.0/>

- immediate open access is provided to the deposited publication via the repository, under the latest available version of the Creative Commons Attribution International Public Licence (CC BY) or a licence with equivalent rights; for monographs and other long-text formats, the licence may exclude commercial uses and derivative works (e.g. CC BY-NC, CC BY-ND) and
- information is given via the repository about any research output or any other tools and instruments needed to validate the conclusions of the scientific publication.

External third-party material such as images, tables, or text will be labelled as such, to clearly identify such content and exclude it from the free use given for consortium-generated material. This can be done by excluding such content in the general license statement and by identifying copyright information next to third-party material included in documents¹⁸.

2.3 Open Research Data and Open City Data

Quality-assured data is a cornerstone of scientific research and of industry and city developments. Research data should be freely, publicly, and permanently available where possible and appropriate to support validation of results and re-use of data for example in research, development, and open or citizen science as well as Open Innovation.

CrAft aims to provide open access to raw and aggregated curated datasets. The project aims to make research data findable, accessible, interoperable and re-usable (FAIR) in line with the HE Guidelines on FAIR Data Management.

Data will be made accessible for verification and reuse through appropriate channels and repositories. Limits of access and availability are to be given in individual data descriptions and will be further developed within the project with the aim of greater openness.

Where research data is made available, it will be made available in recognized repositories such as OpenAIRE or Zenodo, or local repositories of universities or national research institutes, with possible assistance from national OA desks.

¹⁸ For example, in the license label at the beginning of this document: “CC-BY4.0 Creative Commons Attribution, except where otherwise noted.” and a full copyright and attribution next to third-party content in the document.

See also the CC guidelines:

https://wiki.creativecommons.org/wiki/Marking/Creators/Marking_third_party_content

Apart from research data repositories, the sandbox cities in CrAFT are working on or running their own City Open Data Portals, where general data arising from the project may be made available, if it is not done by the participating universities. This is optional, CrAFT cannot mandate this. Data may also be federated into research repositories or other systems. The CrAFT reference cities may generate additional data themselves and may choose to make it available in their repositories. Where suitable, this may be analysed further in CrAFT, and pending further steps, we may find some ways to use or federate some of it, if it furthers the aims of the project. Since the cities are not beneficiaries, this will not be mandated and kept very pragmatic.

The project aims to make anonymised data sets public, but will aim to strike a balance between publication of data and privacy and confidentiality issues. When in doubt, the consortium will refrain from publishing raw datasets and only report aggregate measures. Decisions will be made on a case-by-case basis by senior researchers to ensure that privacy, anonymity, and confidentiality are not breached by publication of datasets or any other type of publication. In addition, ongoing consultation with the relevant Data Protection Offices can be sought during the lifetime of the project.

This will also ensure that data is preserved, available, and discoverable. In any case of data dissemination, national and European legislation will be taken into account. Similar to publications, also for data the project will mostly adopt Creative Commons licenses ranging from attribution to share-alike licenses (such as CC-BY 4.0/CC-BY-SA 4.0).

As above, publications will have bibliographic metadata attached where possible, which is extended to research data. Where possible, research data and associated metadata will be made available in common standards and possibly as Linked Open Data in line with FAIR principles. Annotations will be at minimum at the dataset level, to support interoperability of data.

There is currently no separate operating budget for this, as it will be taken as part of the budget for website and platform management, use existing infrastructure at the Coordinator, other partners, or will use free and open repositories.

2.4 Open Source considerations

Licenses for results will be aimed to be as open as possible, with Creative Commons for documentation and similar core project results (see above), and GNU-style licenses for other results such as software as a default. For example,

GPLv3 (GNU General Public License)¹⁹, MIT²⁰, or Apache²¹ are open and permissible licenses, with GPL additionally using a share-alike model for sharing only under the original conditions (reciprocal license).

Adaptations are expected for where needed to be aligned with commercial IPR strategy. A balance is needed for openness and need for marketability, patenting, and other IPR issues. This will be handled jointly with the Project Coordination Team.

¹⁹ GPL 3.0 <https://www.gnu.org/licenses/gpl-3.0.en.html>

²⁰ MIT License <https://opensource.org/licenses/MIT>

²¹ Apache License, Version 2.0 <https://www.apache.org/licenses/>

3. Data Management, Sharing and Open Access

CrAft will distinguish four key categories of data arising from the project:

- **underlying research data:** data necessary for validation of results presented in scientific papers, including associated metadata, which works hand in hand with the general principle of openness of scientific results. The consortium will provide timely open access to research data in project-independent repositories and link to the respective publications, to allow the scientific community to examine and validate the results based on the underlying data. CrAft has a commitment to publish results via Gold Open Access and has allocated a budget for it. The deposition of research data will depend on the type and channel of publication, ranging from associating data with a publication at the publisher, university or national research data repositories, or the use of the OpenAIRE infrastructure, following the Horizon Europe best practice, with particular focus on peer-reviewed journal articles, conference papers, and datasets of various types.
- **operational and observational data:** This category includes curated or raw data arising from the implementation, testing, and operation of the demonstrators (operational data), and data from related qualitative activities, such as surveys, interviews, fieldwork data, engagement activities (observational data). CrAft will make this data available, in CrAft or respective partner repositories (as above in subsection Open Access to results and publications), opening it up for project partners and stakeholders, and to citizens and interested third parties to support engagement and innovation, where possible and allowed under regulations and privacy issues.
- **monitoring and evaluation data:** This data will specifically be captured to track KPIs of the project performance and will be regularly reported to the EC (see details in D7.3: CrAft M&E framework, forthcoming). The KPI data is considered an internal management tool, but selected KPIs, such as the number of reference cities, will be shared on the website. Evaluation of the project will be done in respective other deliverables and shared that way.

- **documentation, instruments, and reusable knowledge:** This concerns general and specific documentation of the project and demonstration/implementation projects, including tools, methods, instruments, software, and underlying source code needed to replicate the results. A number of collaboration and document management tools will be used, including the project website (WP6, see also D6.1 CrAft visual identity & website²² and D6.2 Dissemination & Exploitation Plan 1²³). Clean and consistent documentation and publication will support dissemination impact. All public Deliverables will be published on the project website in Open Access with open licenses (see Section 2).

3.1 Data Handling Descriptions

Apart from other mechanisms within the project, such as communication, outreach, citizen participation, peer-to-peer learning workshops and networks, measures such as sharing of data, documentation, and results will be an important contributing factor to the project goals. The project will ensure that research data is 'findable, accessible, interoperable and reusable' (FAIR), in line with the HE Guidelines on FAIR Data Management.

The protection of personal data will be a governing principle. Internal and confidential information, personal and privacy-related data and financial information are treated confidentially. Relevant data protection acts including GDPR compliance are ensured, and all personal data is anonymised before it is used for academic/commercial enterprise. Research data is treated according to the policies of the participating research institutions. For personally identifiable information and research data, the policies of the participating research institutions will be strictly followed. Sharing of data within the consortium is governed by the DMP. Sharing of data with external parties is governed by appropriate agreements if needed. NTNU as the Project Coordinator will ensure long-term data curation and preservation beyond the project period for a minimum of 2 years.

The following describes the guidelines and expectations for relevant data sets along with detailed description, metadata, methodology, standards, and collection procedure. Further details are types of data, data formats and

²² CrAft Deliverable [D6.1 CrAft Visual Identity and Website](#)

²³ CrAft Deliverable D6.2 Dissemination and Communication Plan 1 (forthcoming)

vocabularies, storage, deadlines for publication, data ownership rules, and detailed decisions regarding data management and protection.

Issues to be defined will be, for example, the confidentiality needs of utility providers, the privacy needs of citizens, commercialisation and cybersecurity issues, together with general ethical, legal, and regulatory considerations and requirements.

At the time of writing, most tasks have not yet fully defined the type and structure of the data that they need or will generate or can make available. As part of future DMPs, storage, processing, protection, dissemination, retention, destruction will be collected and documented in ongoing refinements.

For this, individual Tasks within the Work Packages will specify and implement approaches related to data collection, management, and processing measures that are most appropriate based on data avoidance, especially concerning personally identifiable aspects of data sets.

Individual data collection will be handled by the involved partners in the Work Packages, keeping most data processing close to the source and within the originating partners.

To ensure maximum use and quality of open research data and re-use of existing data, the project will aim to base much of the internal collaboration on structured research data sets collected in standardised formats. This will help that deposited datasets will be evaluated internally as well regarding their use for the scientific community ('dogfooding', an organisation using its products and services also internally. In this case, also avoiding duplicate work by making as much data as possible available in structured formats for internal use and external dissemination). Such an approach should also support outreach activities such as hackathons, by enabling low-barrier access for external stakeholders. Where possible, research data and associated metadata (standardised as Dublin Core, W3C DCAT, or CSVW) will be made available in common standard machine-readable formats such as Linked Open Data (LOD) in line with FAIR considerations.

The data handling summary is shown in Section 6: Data Summaries.

3.2 Access Rights and Procedures and IPR

In line with the Consortium Agreement and the Grant Agreement, research results are owned by the partner that generates them. However, the stated aim is to make data and results publicly available, whenever possible. Further access rights

and regulations are set forth in the Consortium Agreement as rights and obligations of partners. Data published or otherwise released to the public will include disclaimers and/or terms of use as deemed necessary.

Regarding the protection of intellectual property rights, detailed terms for access rights and collective and individual exploitation of IP are agreed upon in the Consortium Agreement (Section 8, Section 9, Section 10) and Grant Agreement (Section 3, page 43).

Most Deliverables are public, only some management ones are confidential (SEN-sensitive). The latter ones can contain project internals that do not need to be public. Where detailed specifications may contain potentially patentable information, these may be kept confidential. The main approach and commitment is still to have all core results public and replicable. See also the Section above on Open Source considerations.

3.3 Document Management

As noted in the overall consortium plan (D7.1: Consortium Plan 1), documents in the consortium are handled in one overall platform for collaboration and findability. The project has set up a shared file repository in the form of a Google Drive, including collaborative editing tools for documents, spreadsheets, and presentations. The repository is only accessible by invitation. Access will be granted to registered members of the consortium. Generally, it is recommended to not share highly sensitive data, as far as it needs to be shared, on this system, in line with partners' policies.

The handling of sensitive documents will be coordinated with the DPO of the host partner and respective other partners. The partners have internal repositories and processes for dealing with such sensitive data and how it can be shared for research.

Additional sharing and development tools can be set up by specific tasks if needed, such as version control software that is outside the scope of the overall platform, but will be documented and linked there.

3.4 Archiving and Preservation

Deliverables will be archived on the project website. The internal datasets will be backed up periodically so that they can be recovered (for re-use and/or

verifications) in the future. Published datasets, raw or aggregated, will be stored within internal and external repositories and thereby ensure sustainability of the data collection. Records and documentation will be in line with common standards in the research fields to ensure adherence to standards, practices, and data quality.

For all tasks, digital copies of all data will be stored for a minimum of two years after the conclusion of the grant award or after the data is released to the public, whichever is later. All information and data gathered and elaborated will be suitably described in the respective Deliverables. All public Deliverables will be made available and archived on the project website and through the EU Community Research and Development Information Service (CORDIS) for the project²⁴. The project aims to make research data and publications freely available through Open Access and suitable repositories.

The partners together with NTNU as the Coordinator will ensure long-term data curation and preservation beyond the project period. It will be implemented as sustainability of project documentation, results, and website, linked to WP7, WP6, and the other WPs.

²⁴ Creating Actionable Futures | Projects | HORIZON | CORDIS | European Commission, <https://cordis.europa.eu/project/id/101056946>

4. Ethics Considerations

Some of the activities in CrAft will require data processing and some may require evaluation involving human research subjects and the collection of personal data, as part of community engagement activities etc.

The ethics self-assessment and Ethics Summary Report identified two ethical issues: 1) human participation, 2) personal data collection of data subjects. An initial assessment was included in the GA and summarised below:

Ethical dimension of the objectives, methodology and likely impact

The project will process personal data of human participants through activities such as events, workshops, interviews, surveys, and co-creation activities. These are standard activities of social and humanities research. NTNU and the other universities have extensive experience with this type of work and the needed methodology as well as ethics approval requirements and processes, including informed consent, treatment of personal data, and safeguarding personal interests, anonymisation, and publication of results in compliant ways.

No negative impacts of the activities are currently foreseen. Details will be developed within the WPs and within the DMP with the relevant partners.

Compliance with ethical principles and relevant legislation

All planned activities are foreseen to be well within all applicable legal and ethical guidelines and regulations. Where ethical board approval will be needed, it is foreseen that it will be granted as part of the usual work and methods of the partners.

Partners will adhere to strict ethical principles in all work that they do. Compliance with applicable national and EU regulations and legislation, as well as ethical requirements will be ensured before any activities are taking place. This is the responsibility of the leading partner and participating partners, and will be planned and documented in the DMP. For cross-country activities, partners will ensure that the activity is legal in all participating jurisdictions.

GDPR compliance will be ensured, and all partners are aware of the respective regulations, including own responsibility for any GDPR-governed activities. Partners will comply with data storage, retention, access rights, anonymisation, and deletion policies of their institutes for personal data.

NTNU homed in Norway as a non-member state will ensure that activities are allowed within the other countries participating in the project, based on the rule of being allowed in at least one EU Member State. Norway implements most EU regulations, so there is a very limited gap in regulations. The NTNU Data Protection Officer is aware of these requirements and is updated on ongoing projects.

All activities within CrAft will be conducted in compliance with fundamental ethical principles and will be underpinned by the principle and practice of Responsible Research and Innovation (RRI)²⁵. RRI is important in the City context where projects work to transform processes around cities and citizens. Through the CrAft approaches of Open Innovation and Quadruple Helix collaboration, societal actors and stakeholders will work together to better align the project outcomes with the general values, needs and expectations of society. The project uses open data and openness as part of co-creation and Open Innovation 2.0 and for stakeholder participation through measures such as open data, open licences, public deliverables, outreach, living labs, etc.

The consortium confirms that the ethical standards and guidelines of Horizon Europe will be rigorously applied, regardless of the country in which the research will be carried out, and that all data transfers will be permissible under all necessary legal and regulatory requirements.

All proposed tasks are expected to be permissible under the applicable laws and regulations, given proper observance of requirements. Where appropriate information and consent of all stakeholders and citizens is mandated, the consortium will ensure that all necessary procedures are followed, particularly with regard to the signing, collation, and storing of all necessary Informed Consent Forms prior to the collection of any data. All involved stakeholders and citizens will be informed in detail about measures and the consortium will obtain free and fully informed consent.

All necessary actions will be taken within the project management and by all beneficiaries to ensure compliance with applicable European and national regulations and professional codes of conduct relating to personal data protection. This will include in particular Directive 95/46/EC regarding data collection and processing, the General Data Protection Regulation (GDPR, 2016/679), and respective national requirements, ensuring legal and regulatory compliance. Ethics considerations will feed into research and data collection

²⁵ See HE Work Programme. For reference: EU H2020 Responsible research & innovation <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>

protocols used in the project. This will include the collecting and processing of personal data as well as surveys and interviews. For all identified issues, in line with the above standards, ethical approvals will be obtained from the relevant national data protection authorities and/or institutional boards.

In line with existing regulations by the university partners relevant for social science research, the mapping of the ID and the person will be safeguarded and will not be available to persons other than the ones working with the data. This will minimise the risks of ethical violations. Since data stemming from other kinds of research might be de-anonymized and reconnected to a person, discipline-specific study designs aim to mitigate or remove this risk as well for different types of data collection. Results may be used in anonymised or aggregated form for analysis and subsequent publication in project reports and scientific papers. All beneficiaries will handle all material with strict care for confidentiality and privacy in accordance with the legal and regulatory requirements, so that no harm will be done to any participants, stakeholders, or any unknown third parties. NTNU as the coordinator has internal guidelines that comply with GDPR and these will be followed in all data management.

In addition to relevant national data protection authorities, the university partners have separate institutional ethics boards or respective national research boards, which will ensure the correct implementation of all human participation and data protection procedures and protocols around social science research.

In detail, this includes for Norway (NTNU) the Norsk samfunnsvitenskapelig datatjeneste (NSD) – National Data Protection Official for Research; for Italy (UNIBO) the UNIBO Office for General Processing of Data²⁶ and the Regional Office for the Unique Registration Third Sector (“Terzo Settore”) of the Emilia Romagna Region²⁷; AUAS (the Netherlands) must ensure that all studies conducted at AUAS are conducted in accordance with the Netherlands code of Conduct for Research Integrity, i.e. through the AUAS Research Ethics Committee²⁸; and for the Czech Republic (CVUT) the Office for personal data protection²⁹.

²⁶<https://www.unibo.it/en/university/privacy-policy-and-legal-notes/privacy-policy/anyone-who-uses-university-services-and-tools-or-contributes-to-the-implementation-of-institutional-activities>

²⁷<https://sociale.regione.emilia-romagna.it/terzo-settore/informativa-trattamento-dati-personali>

²⁸<https://www.amsterdamuas.com/practical-matters/employees/auas/education-and-research/research-ethics-and-integrity/research-ethics-and-integrity.html>

²⁹ <https://www.uoou.cz/en/>

The universities have internal processes and forms to be adapted to ensure full information and informed consent for data collection from human participants.

Further details will be developed within the respective tasks, and input into ongoing versions of the DMP.

5. Dissemination and Exploitation

Disseminating and exploitation of the project outputs and results are an important step to achieve the project goals. This is done in cooperation with WP6 on Storytelling, dissemination & exploitation, and all other relevant WPs. As detailed above, data will be made as open as possible. All consortium partners together take responsibility for exploitation and dissemination of results and to ensure visibility and accessibility of results. Implementing FAIR data principles will support the openness and re-use of data. Different dissemination channels are estimated to be used and maintained during and after the project as shown in the following table:

Dissemination type	Usage	Policy
Website	Main reference point for project dissemination and data description	Creative Commons where applicable. External rights clearly marked.
Deliverables	Deliverables to the EU and the public. Disseminated through the project website craft-cities.eu and the EU CORDIS system.	Dissemination level set per deliverable, public by default and open with Creative Commons Attribution CC-BY4.0.
Social Media	Support of communication activities	To be decided. Creative Commons where applicable
Newsletters	Regular updates and links to website and other channels	Creative Commons where applicable
Publications	Scientific and other publications arising from the project	Open Access as detailed above
Benchmarking, Monitoring & Evaluation, KPIs	Monitoring of indicators for project performance	Most project KPIs measure internal progress. Some with outside relevance will be shared in respective

		channels. Evaluation results of the project will be published in respective deliveries and deliverables. Details can be found in the forthcoming D7.3: CrAft M&E framework
Research data as laid out in Data Management section	Underlying research data of the project	Open Access with limitations due to privacy, as detailed above, in accordance with the FAIR guidelines on Data Management
Any other data	TBD	Where ever possible, open through Creative Commons or other open licenses.

6. Data Summaries

6.1 Data Summary template

The following table shows the data handling summary template we intend to use within the DMP and within Tasks for documentation:

Template for data handling and management summary

Task/Demo/Activity	Task/Dataset Name
Description	
Purpose and relevance of data collection and relation to objectives	
Methodology	
Data source, data ownership	
Standards, data formats, vocabularies	
FAIR considerations/ compliance (findable, interoperable, accessible, reusable)	<p>'findable, accessible, interoperable and reusable'</p> <p>See also OpenAIRE on principles and minimal requirements: https://www.openaire.eu/how-to-make-your-data-fair</p> <p>See also older detailed H2020 guidelines: https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf</p> <p>See also well-described sub-requirements here: https://www.go-fair.org/fair-principles/</p>
Storage	
Security & Privacy considerations	
Exploitation/Dissemination	
Dissemination Level, Limitations, Approach, Justification	

Stakeholders	
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6.2 Data Summaries

This section is empty at the beginning of the project.

7. Conclusion

This deliverable constitutes the initial DMP for CrAft at the time of delivery of December 2022. The Project Management Team will regularly follow up with the consortium members to refine and update the DMP. Responsibilities reside with NTNU and all consortium members.

More detailed procedures, descriptions, forms, etc. will be added as they become available through the ongoing work in the respective Work Packages. The next update will include detailed data summaries for the work that is being started in that period.

The DMP will be updated annually, with the next regular update due in M12 as D7.6 Open Science and Data Management Plan 2. Updates will include more detailed processes and descriptions of data sets.

List of Acronyms

CA	Consortium Agreement
DoA	Description of Action
EC	European Commission
EU	European Union
GA	Grant Agreement
GDPR	General Data Protection Regulation
HE	Horizon Europe
IPR	Intellectual Property Right
KPI	Key Performance Indicator
MS	Milestone
OA	Open Access
PM	Project Manager
PO	Project Officer
WP	Work Package
WPL	Work Package Lead

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