



Grant Agreement N°: 957317
Topic: ICT-42-2020
Type of action: IA



AFFORDABLE 5G

High-tech and affordable 5G network roll-out to every corner

D6.2: Data Management Plan

Revision: v.1.0

Work package	WP 6
Task	Task T6.4
Due date	31/01/2021
Submission date	12/04/2021
Deliverable lead	ATOS
Version	1.0

Document Revision History

Version	Date	Description of change	List of contributor(s)
V0.1	18/12/2020	TOC	ATOS
V0.2	15/02/2021	Management Dataset	ATOS
V0.3	22/02/2021	Pilot 1 dataset, PoC Dataset, Dissemination Dataset	NEM, UMA, MARTEL
V0.4	28/02/2021	Section 2	ATOS
V0.5	04/03/2021	Pilot 2 dataset	UBI
V0.6	08/03/2021	Section 2 finalized	ATOS
V0.7	09/03/2021	Executive summary, section 1, and conclusion	ATOS
V0.8	26/03/2021	Review	NKUA
V0.9	09/04/2021	Update and included abbreviations	ATOS
V1.0	12/04/2021	Quality review and submission to EC	ATOS

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Project co-funded by the European Commission in the H2020 Programme

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Dissemination Level		
PU	Public, fully open, e.g. web	√
CI	Classified, information as referred to in Commission Decision 2001/844/EC	
CO	Confidential to AFFORDABLE5G project and Commission Services	

* R: Document, report (excluding the periodic and final reports)

DEM: Demonstrator, pilot, prototype, plan designs

DEC: Websites, patents filing, press & media actions, videos, etc.

OTHER: Software, technical diagram, etc

EXECUTIVE SUMMARY

This document presents a first version of the Data Management Plan for AFFORDABLE5G with the main aim of supporting the data management life cycle of all data processed and collected by the project.

This deliverable provides an initial description of the Datasets identified according to the FAIR principles to make the research data *Findable, Accessible, Interoperable and Re-usable*. For collecting such information, the European Commission suggests a template that follows the FAIR Data Management Plan Model. This template was analysed and distributed to relevant partners that deal with several data aspects of the project: the pilot's partners, the dissemination leader, and the coordinator.

The project has initially identified a list of 6 datasets and a detailed FAIR questionnaire has been completed for each one.

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ABBREVIATIONS

3GPP	3rd Generation Partnership Project
5GS	5G System
CI/CD	Continuous Integration / Continuous Delivery
CVAE	Computer Vision Analytics for Emergencies
DoA	Description of Action
FAIR	Findable, Accessible, Interoperable and Re-usable
GA	Grant Agreement
GPRD	General Data Protection Regulation
IIoT	Industrial Internet of Things
ISP	Internet service provider
MCPTT	Mission Critical Push To Talk
MCS	Mission Critical Services
MQTT	Message Queue Telemetry Transport
NFV	Network Function Virtualisation
O-RAN	Open Radio Access Network
PoC	Proof of Concept
SC	Small Cell
SIP	Session Initiation Protocol
TSN	Time Sensitive Networking
UE	User Equipment
UP	Urban Platform
UPF	User Plane Function
VNF	Virtual Network Function
WP	Workpackage

1 INTRODUCTION

The main purpose of the Data Management Plan is to describe all the datasets processed along the lifetime of the project. The datasets identified should be accordance to the data management policy and the FAIR principles (Findable, Accessible, Interoperable, and Re-usable). For that reason, in Affordable5G, a template was customised and shared within the consortium.

As described in the Guidelines of FAIR Data Management in Horizon 2020 [1], this template is a set of questions that the partners answer with a level of detail appropriate to the project. For this version, it is not required to provide detailed answers to all the questions since some can be unknown yet, however further update could be submitted whenever significant changes arise, for example:

- New data
- changes in consortium policies (e.g. new innovation potential, decision to file for a patent)
- changes in consortium composition and external factors (e.g. new consortium members joining or old members leaving).

Affordable5G is an Innovation Action under the 5G PPP programme initiative and commits to collaborate with other R&D projects in the programme. Relevant deliverables will be shared in the common BSCW repository established for this purpose.

Within this deliverable, we have identified the project's first list of datasets that are fully explained in sections below

DATASET 01 - Mission Critical Services

DATASET 02 - Smart City Edge and Lamp post IoT deployment

DATASET 03 - TSN PoC lab environment

DATASET 04 - Affordable5G Website

DATASET 05 - Affordable5G Newsletter

DATASET 06 - Project Management

1.1 Structure of the document

The deliverable is divided in 5 sections:

Section 1 gives a short introduction regarding the purpose of the document and the datasets identified at this stage of the project.

Section 2 details an overview of the datasets that will be generated/collected in Affordable5G

Section 3 provides an explanation of the datasets following FAIR data principle

Section 4 presents all the answers from the datasets identified following the template recommended by the European Commission.

Section 5 gives a conclusion and future steps with respect to the Data Management Plan.

2 DATA SUMMARY

Affordable5G is a project which main vision is optimising hardware usage and open software platforms for 5G network elements. To achieve the project objectives, a set of datasets are expected to be generated or collected within the project lifetime:

- Collect data for Pilots:** The partners leading the use cases provide the necessary requirements, in order to gather as much information as possible for identifying use case scenarios, KPIs, software functionalities and tools to be developed. The information gathered is presented in deliverable D1.1 State of the art, technical system [3], requirements analysis and pilot element descriptions elaborate in the scope of Task T1.1. Additionally, task T1.4 also contributed to assess some security aspects and vulnerabilities in the use cases in the deployment scenarios.
- Communication and dissemination data:** This include data from WP5 Dissemination, business modelling, opportunities for SMEs, and standardisation and 5G PPP collaboration, in two main aspects: Website and newsletters. the data collected from the website visitors is needed for maintaining contact, and as required by law for any legal agreement we have with them. The data and information collected are used to optimize content and performance of the website and may also be used in the event of attacks on our information technology systems. Additionally, the personal data collected as part of a registration for the Affordable5G newsletter will only be used to verify registrations and to send our newsletter.
- Management data:** The data generated is included in WP6 Project Management, related to user accounts and profile data (name, entity, mail address, etc...) required for internal administrative activities such as project's mailing lists management and the document repository in ownCloud¹

The table below shows details of the datasets identified in Affordable5G. They will be updated as more data are produced in the project.

DATASET 01	Dataset name: Mission Critical Services
	Partner: Nemergent
1. Data Summary	
Purpose	The data collection and generation purposes are based on the monitoring of the Mission Critical Service (MCS) KPIs/activity and logs to evaluate the performance of Emergency Communications Pilot.
Types and formats of data	<ul style="list-style-type: none"> SIP messages JSON format <ul style="list-style-type: none"> To upload the VNFs content depending on the lifecycle of the experiment. To monitor the service performance Others <ul style="list-style-type: none"> [.doc and/or .pdf format documents resuming the experiment outcome.]
Re-use of existing data	No

¹ <https://owncloud.org/>

Origin	<ul style="list-style-type: none"> • UE originating/terminating the MCPTT / MCVideo / MCDData • Mission Critical Application Server
Expected size	<ul style="list-style-type: none"> • SIP messages ~ 3kB • JSON file ~14KB • Other files size is unknown at this stage of the project
Utility	The Emergency Communication pilot optimal development

DATASET 02	Dataset name: Smart City Edge and Lamp post IoT deployment
	Partner: UBI
1. Data Summary	
Purpose	The data collection and generation purposes are based on the monitoring of the CVAE service KPIs/activity and logs to evaluate the performance of the computer-vision based Smart City Pilot.
Types and formats of data	<ul style="list-style-type: none"> • JSON data for exposed APIs • MQTT (likely Image ZMQ messaging library) for high performance transmission of video • Packed YAML descriptors for onboarding of the application
Re-use of existing data	No
Origin	<ul style="list-style-type: none"> • IoT devices (namely CCTV Cameras), IoT sensors/probes • Core CVAE modules to edge CVAE modules to transmit correlated data • Urban Platform to CVAE and vice-versa Service to offer interaction with human operators • UPF O-RAN breakdown information at the edge to offer monitoring data about UEs
Expected size	<ul style="list-style-type: none"> • JSON – depends on the request, expected in the order of 20KiB • MQTT – also depends on the size of the images. Assuming 4k, 5fps, will be around Mb/s • Packed YAML descriptors of the service expected around 500KiB
Utility	Smart City pilot operation in optimal conditions

DATASET 03	Dataset name: TSN PoC lab environment
	Partner: UMA
1. Data Summary	
Purpose	The datasets include information on the traffic exchanged during the experiments to be conducted when researching towards the TSN proof of concepts. The data will be used to understand impact of the different configuration parameters like delay, jitter, and others.
Types and formats of data	Document, data, images
Re-use of existing data	<ul style="list-style-type: none"> • Documents and images: All common electronic document formats (.docx, .pdf, .tex, etc.) • Data: text format tables and standard file format for traffic packet capture
Origin	Project activities and experiments associated to the TSN proof of concept
Expected size	To be determined
Utility	The collected dataset will be used for future reference when analysing packet timeseries and synchronisation issues

DATASET 04	Dataset name: Affordable5G Website
	Partner: Martel
1. Data Summary	
Purpose	The data collected from the website visitors is needed for maintaining contact, and as required by law for any legal agreement we have with them. The data and information collected are used to optimize content and performance of the website and may also be used in the event of attacks on our information technology systems.
Types and formats of data	<p>The web site collects the following data:</p> <ul style="list-style-type: none"> • User account data: i.e. account of users authorised to publish content on the web site. This are in general users' part of MARTEL and in some cases of other third parties in the Affordable5G authorised to publish news on the web site. This may include: <ul style="list-style-type: none"> - Name and relevant titles - Email - Job title - Company name • Contact data: i.e. data provided by web sites visitors filling in contact forms to request information to the Affordable5G consortia. This may include: <ul style="list-style-type: none"> - Name and relevant titles - Email - Job title - Company name - Company address (in very rare cases) • Access log data: i.e. data that are collected by servers to control access to the web pages of the web site that may be used in the event of attacks and other cases requested by the law. This may include (1) the browser types and versions used, (2) the operating system used by the accessing system, (3) the website from which an accessing system reaches our website (so-called referrers), (4) the sub-websites, (5) the date and time of access to the Internet site, (6) an Internet protocol address (IP address), (7) the Internet service provider of the accessing system, and (8) any other similar data and information that may be used in the event of attacks on our information technology systems.
Re-use of existing data	No existing data is re used.
Origin	<p>All data we store has been clearly and voluntarily provided to us by contacts and partners (subscribing to a newsletter, sending us an email, giving us their business card, answering to an online questionnaire etc.).</p> <ul style="list-style-type: none"> • The website collects a series of general data and information when a data subject or automated system calls up the website. • The website contains information that enables a quick electronic contact to the project's consortium, as well as direct communication with Affordable5G, which also includes a general address of the so-called electronic mail (e-mail address). If a data subject contacts the project by e-mail or via a contact form, the personal data transmitted by the data subject are automatically stored. Such personal data transmitted on a voluntary basis by a data subject to Martel as data owner are stored for the purpose of processing or contacting the data subject.

	As is common practice with almost all professional websites this site also uses cookies, to improve visitors' experience. In some special cases we also use cookies anonymized provided by trusted third parties (such as Google Analytics) – More details are provided in the Cookie Policy page of Affordable5G's website: https://www.affordable5g.eu/cookie-policy/ .
Expected size	We collect minimal data from our site visitors.
Utility	Data and information collected are needed to (1) deliver the content of our website correctly, (2) optimize the content of our website as well as its advertisement, (3) ensure the long-term viability of our information technology systems and website technology, and (4) provide law enforcement authorities with the information necessary for criminal prosecution in case of a cyber-attack.

DATASET 05	Dataset name: Affordable5G Newsletter
	Partner: Martel
1. Data Summary	
Purpose	The personal data collected as part of a registration for the Affordable5G newsletter will only be used to verify registrations and to send our newsletter.
Types and formats of data	<ul style="list-style-type: none"> E-mail address of visitors registering to the newsletter. During the registration for the newsletter, we also store the IP address of the computer system assigned by the Internet service provider (ISP) and used by the data subject at the time of the registration, as well as the date and time of the registration. The newsletter of Affordable5G contains so-called tracking pixels. A tracking pixel is a miniature graphic embedded in such e-mails, which are sent in HTML format to enable log file recording and analysis. Based on the embedded tracking pixel, Martel may see if and when an e-mail was opened by a data subject, and which links in the e-mail were called up by data subjects.
Re-use of existing data	No existing data is re-used
Origin	The personal data is collected previous informed consent upon registration to the newsletter through the dedicated page of Affordable5G's website.
Expected size	Between 100 and 200 records
Utility	Data collected express the interest of subscribers to receive news from Affordable5G project.

DATASET 06	Dataset name: Project Management
	Partner: ATOS
1. Data Summary	
Purpose	This dataset will contain administrative data for the management of the project. It will include administrative information from the partners
Types and formats of data	<p>Word, spreadsheets, and reports.</p> <p>Contact and Admin data: i.e. data provided by partners in contact forms to request information to the Affordable5G consortia. This may include: Name and relevant titles, Email, Job title, Phone number, Company</p>

	name, Company address, Bank accounts number and holders, Legal representatives, etc
Re-use of existing data	No, it is internal data to this project
Origin	Data provided by each partner
Expected size	kbytes
Utility	The information within this dataset is part of the WP6 management activities.

3 FAIR DATA

3.1.1 Findability

In order to make all the public information produced by the project findable for the researchers and stakeholders, the dataset used will include search keywords that will optimize possibilities for re-use. A good document nomenclature that facilitate the searching of the data will also be provided. This naming and versioning protocol has already defined in D6.1 Project handbook [3].

The deliverables should follow the nomenclature below:

<Project_Name>_<Dx.y>_<Deliverable_Name>_<vm.n>_<Suffix>

Where:

- **Project Name:** Refers to the project short name. (AFFORDABLE5G)
- **Dx.y:** Is the deliverable number as defined in the DoA, where:
 - x: the number of the corresponding work package,
 - y: **the deliverable number within the work package.**
- **Deliverable Name:** Refers to the name of the deliverable that should be matched exactly with the name of the deliverable as defined in the DoA
- **vm.n:** Refers to the version of the deliverable, where:
 - m: 0 for the draft versions, 1 for the final version (delivered to the EC),
 - n: consecutive number from 0 to 9, which can be extended to several digits if necessary.
- **Suffix:** This is optional and can be used to identify intermediate versions or contributions from partners to a draft version (never in a final version) and could include dates, short name of partners, etc.

In the context of the project, depending of the nature of the data, the following type of metadata could be used:

- **Structural:** Facilitates the navigation between data and resources.
- **Descriptive:** Identification of the data in terms of title, date, abstract, author or keywords.
- **Administrative:** Identifies who can access the data and the restrictions to be applied in the file, the location of the data, etc...

3.1.2 Accessibility

Affordable5g data will be accessible by different channels that will ensure broad visibility and raise awareness about the project and its results.

For Scientific publications, as we have mentioned in the GA, Affordable5G adopts a combined strategy for Open Access, allowing maximum impact for broad dissemination without increased cost, offering access to restricted materials. These publications will be carried out by publishing either in green or gold open access channels. Green open access, where the authors will deliver their own final published versions or will allow free and open access to them. However, if this option is not appropriate enough, the project is considering reserving budget to pay for providing public access to their papers through the gold open access.

Affordable5G promotes an open approach for sharing all its results, therefore any article or scientific publication prepare during the project will be made available through an OpenAire-compliant repository (open research repository Zenodo), according with the Grant Agreement and the Horizon 2020 Open Access Guide

The deliverables that have been defined in the Description of the Action (DoA) with nature “Public”, will be available through the project website (www.affordable5g.eu) after they are reviewed and approved by the EC. For the rest of the deliverables, the accessibility is limited for the consortium members in the project repository.

Deliverable D5.1 Dissemination and Communication Channels and Plan [4], shows the different channels where the data will be accessible. This document presents the different channels used for the project, namely:

- Online channels:
 - Project official website
 - e-Newsletter
 - Social media channels, such as Twitter and LinkedIn.
 - e-Publications and Scientific Publications
 - Press releases
 - Videos
 - Webinars
- Offline channels:
 - Promotional materials (project flyers and posters)
 - Events

3.1.3 Interoperability

Making data interoperable, will facilitate the exchange and re-use between different organizations and research institutions. In order to meet the required interoperability standards, Affordable5G is analysing all datasets to have a common data and metadata capture and creation. The standards to follow are:

1. metadata will use keywords
2. metadata will contain vocabulary according to the FAIR Principles.
3. metadata will be available in a commonly used formats. (PDF, XML, JSON, YAML, etc).

Affordable5G is governed by the procedure of GA Article 29.2 related to Open access to scientific publications. Therefore, the bibliographic metadata will be in standard format and include the following:

- the terms “European Union (EU)” and “Horizon 2020”
- the name of the action, acronym and grant number.
- the publication date, and length of embargo period if applicable, and
- a persistent identifier

Once the project is advancing, and all the information used, is recognized, and gathered , additional data on making information interoperable will be provided in an updated version of the Data Management Plan.

3.1.4 Re-usability

The reusability of the data within this project, will be published after the submission and approval of the public deliverables and 1 year after the end of the Project. The openly share dataset created along the project lifetime, will be made reusable in any project platforms: Affordable5G website, project repository, Gitlab, among others.

Regarding the quality evaluation, we have established procedures (see D6.1 Project Handbook) in order to guarantee that the deliverables are submitted with a high level of quality. Each deliverable will have two organizations as peer reviewers that analyse the document in two ways the format (keywords, table of figures, executive summary, etc.) and the most important part the content (clarity, innovation, references, etc...)

In order to permit the widest re-use of the data, the consortium will discuss the most appropriate licencing for the datasets at a later stage of the project.

3.2 Allocation of resources

According to the GA Article 6, the costs related to dissemination aspects related to open access data are eligible for reimbursement. Therefore, all the data management costs are already covered by the project by the resources allocated in the budget.

As we have mentioned in section 3.1.2 for Scientific publications, they will be published in green open access, just in cases that this option is not possible, the consortium will study reserving budget to for providing public access to their papers through the gold open access.

The responsibilities for the data management, are summarized below:

- 1- Atos as a project coordinator, is responsible of writing the data management plan in collaboration with the pilot's partners and dissemination leader.
- 2- Atos, NKUA as a technical coordinator and MARTEL as dissemination leader are responsible of supervising all the data management activities (for publications and piloting) generated along the project lifetime.
- 3- Martel, as the dissemination leader as well as the rest of the consortium are responsible to study on the best publication path (green or gold open access) of all the scientific publications issued.
- 4- The consortium is responsible to follow the H2020 open data requirements with respect to any publications open access publications.

3.3 Data security, archiving and preservation

Affordable5G counts with procedures and tools to archive, preserve the generated/collected data in the project.

Atos as project coordinator, is responsible for the general maintenance of the project repository, which is hosted in OwnCloud, and includes deliverables, meetings documentations (agendas, minutes and presentations), administrative documents (GA, CA, amendments) and for any other document used for the development of the project. All partners are responsible for supporting the documentation management process. The server is only accessible for consortium team members that have signed the Data Protection Consent Form.

As we have mentioned in D6.1 Data Management Plan regarding security measures, this repository is repository is subject to the ATOS Information Security Policy, aiming at safeguarding the confidentiality, integrity, availability, authenticity and non-repudiation of information and information systems. It is based on an internationally accepted security standard (ISO27002 -, Code of Practice for Information Security Management [5])

Regarding the data hosted at the website, MARTEL, has established mechanisms to preserve the project data such as: cookies, encrypted connections for accessing and encrypted user passwords among others . Further information could be found in section 4.

3.4 Ethics and legal compliance

All Affordable5G consortium is fully aware of the ethical aspects for all research activities involved in the project. Any ethical issue that might arise during the project lifetime, will be carefully analysed and will follow the ethical rules and standards of H2020, as well as those reflected in the Charter of Fundamental Rights of the European Union and the General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679) [6]

The compliance with all the ethical requirements set out in the project are managed under WP7 and the deliverables associated:

- D7.1 : POPD - Requirement No. 1: showing the information and operational details that show how compliance with the requirements is organized.
- D7.2 : POPD - Requirement No. 2: explicitly endorsed by the DPO of all partners, to confirm and explain compliance with the privacy policy of the consortium and with the EU regulations, including the GDPR.
- D7.3 : POPD - Requirement No. 3: including the names and contact details of the DPOs and publicly announced in the privacy policy that will be used to inform the data subjects involved and to seek their consent.
- D7.4 : POPD - Requirement No. 4: including a declaration of compliance with the respective national legal frameworks.
- D7.5: POPD - Requirement No. 5: explanation of how all of the data they intend to process is relevant and limited to the purposes of the research project (in accordance with the 'data minimisation 'principle)
- D7.6 : POPD - Requirement No. 6: explanation of why the research data will not be anonymised/ pseudonymised.
- D7.7 : POPD - Requirement No. 7: A description of the technical and organisational measures that will be implemented to safeguard the rights and freedoms of the data subjects/research participants.
- D7.8 : POPD - Requirement No. 8: A description of the security measures that will be implemented to prevent unauthorised access to personal data or the equipment used for processing
- D7.9 : POPD - Requirement No.9: A description of the Anonymisation / pseudonymisation techniques that will be implemented.
- D7.10 : POPD - Requirement No. 10: Detailed information on the informed consent procedures in regard to data processing.
- D7.11 : POPD - Requirement No. 11: A copy of the templates of the informed consent forms and information sheets.
- D7.12 : POPD - Requirement No. 12: Data Protection Impact assessment.
- D7.13 : POPD - Requirement No. 13: A clear overview of the tasks and responsibilities with respect to ethical roles in the project, including "Data Processor Agreements".

4 AFFORDABLE5G DATASETS

4.1 Datasets for piloting activities

4.1.1 Pilot 1: Emergency communications

DATASET 01	Dataset name: Mission Critical Services	
	Partner: Nemergent	
1. Data Summary		
Purpose	The data collection and generation purposes are based on the monitoring of the MC service KPIs/activity and logs to evaluate the performance of Emergency Communications Pilot.	
Types and formats of data	<ul style="list-style-type: none"> • SIP messages • JSON format <ul style="list-style-type: none"> - To upload the VNFs content depending on the lifecycle of the experiment. - To monitor the service performance • Others <ul style="list-style-type: none"> - [.doc and/or .pdf format documents resuming the experiment outcome.] 	
Re-use of existing data	No	
Origin	<ul style="list-style-type: none"> • UE originating/terminating the MCPTT / MCVideo / MCDData • Mission Critical Application Server 	
Expected size	<ul style="list-style-type: none"> • SIP messages ~ 3kB • JSON file ~14KB • Other files size is unknown at this stage of the project 	
Utility	The Emergency Communication pilot optimal development	
2. FAIR data		
2.1 Making data findable, including provisions for metadata		
Is the data discoverable	No	
Naming conventions	Naming contained in Rrelease R14 and R15 from 3GPP for the obtained KPI	
Keywords	No	
Versioning	No version numbers are going to be used	
Metadata creation	No metadata will be created	
2.2 Making data openly accessible		
Data openly accessible	Mission Critical Specific standardized KPIs, activity and logs	
How it will be accessible	To be confirmed further in time	
Methods/software tools needed to access the data	To be confirmed further in time	
Repository	MC service backend, no certified repositories, information given on demand or by proper credentials	
Access restrictions	Proper credentials will be given	
2.3 Making data interoperable		

Interoperability	There will be no described data exchange
Metadata, vocabularies, and standards	N/A
Use of standard vocabularies	N/A
Mappings to commonly used ontologies	N/A
2.4 Increase data re-use (through clarifying licenses)	
License	Obtained and created data will be project specific and experiment resultant, no re-use is considered.
Available for re-use	N/A
Third party usability after the project	N/A
How long will remain re-usable	N/A
Data quality assurance process	N/A
3. Data security, archiving and preservation	
Security procedures	Entries will not be encrypted in database (MC service backend). If required, only the logging message content may be encrypted.
4. Ethics and legal compliances	
Possible ethical or legal aspects	N/A
Consent for data sharing and long-term preservation	N/A

4.1.2 Pilot 2: Smart City Edge and Lamp post IoT deployment

DATASET 02	Dataset name: Smart City Edge and Lamp post IoT deployment
	Partner: UBI
1. Data Summary	
Purpose	The data collection and generation purposes are based on the monitoring of the CVAE service KPIs/activity and logs to evaluate the performance of the computer-vision based Smart City Pilot.
Types and formats of data	<ul style="list-style-type: none"> • JSON data for exposed APIs • MQTT (likely Image ZMQ) for high performance transmission of video • Packed YAML descriptors for onboarding of the application
Re-use of existing data	No
Origin	<ul style="list-style-type: none"> • IoT devices (namely CCTV Cameras), IoT sensors/probes • Core CVAE modules to edge CVAE modules to transmit correlated data • Urban Platform to CVAE and vice-versa Service to offer interaction with human operators • UPF O-RAN breakdown information at the edge to offer monitoring data about UEs
Expected size	<ul style="list-style-type: none"> • JSON – depends on the request, expected in the order of 20KiB • MQTT – also depends on the size of the images. Assuming 4k, 5fps, will be around Mb/s • Packed YAML descriptors of the service expected around 500KiB
Utility	Smart City pilot operation in optimal conditions

2. FAIR data	
2.1 Making data findable, including provisions for metadata	
Is the data discoverable	No
Naming conventions	Emergency detection and tracking based on automatic computer vision analytics
Keywords	Emergency detection, object tracking, computer vision, machine learning, tensorflow, edge processing
Versioning	Will bump the version decimal part of the number on minor changes, and main number on major releases
Metadata creation	Metadata associated with video quality for different cameras will be generated and assessable through the core REST API
2.2 Making data openly accessible	
Data openly accessible	Data will be available to authorized personnel
How it will be accessible	Through Urban Platform mostly, but also using REST APIs
Methods/software tools needed to access the data	Urban Platform frontend, browser or/and API client (e.g., Postman)
Repository	Repository will be available and should be assessable in the core
Access restrictions	Authentication and authorization only be authorized personnel
2.3 Making data interoperable	
Interoperability	No plans at the moment to interact with third-party modules
Metadata, vocabularies, and standards	N/A
Use of standard vocabularies	N/A
Mappings to commonly used ontologies	NA
2.4 Increase data re-use (through clarifying licenses)	
License	Most likely, but not yet fixed, Apache 2.0
Available for re-use	It is intended to make the code open source when it reaches a certain maturity level
Third party usability after the project	The project will be well documented and ready to be installed and tried by external parties
How long will remain re-usable	The intention is to preserve it for as long as it makes sense, i.e., when technologies remain compatible and pertinent
Data quality assurance process	Using a CI/CD platform in defined test pipelines will be employed during the development of the project
3. Data security, archiving and preservation	
Security procedures	Inside the core, information will not be encrypted. The rest of communications, namely CCTV cameras to edge modules, edge modules to core modules and core APIs will provide encryption and AAA.
4. Ethics and legal compliances	

Possible ethical or legal aspects	CVAE service will be gathering images from public spaces, this should be authorized by government authorities if the product reaches the market.
Consent for data sharing and long-term preservation	Only detected emergency situations will be recorded, the rest of images and information will be immediately discarded.

4.1.3 PoC: Industrial manufacturing private network

DATASET 03	Dataset name: TSN PoC lab environment	
	Partner: UMA	
1. Data Summary		
Purpose	The datasets include information on the traffic exchanged during the experiments to be conducted when researching towards the TSN proof of concepts. The data will be used to understand impact of the different configuration parameters like delay, jitter, and others at lab level.	
Types and formats of data	Document, data, images	
Re-use of existing data	<ul style="list-style-type: none"> Documents and images: All common electronic document formats (.docx, .pdf, .tex, etc.) Data: text format tables and standard file format for traffic packet capture 	
Origin	Project activities and experiments associated to the TSN proof of concept	
Expected size	To be determined	
Utility	The collected dataset will be used for future reference when analysing	
2. FAIR data		
2.1 Making data findable, including provisions for metadata		
Is the data discoverable	Not foreseen.	
Naming conventions	N/A	
Keywords	N/A	
Versioning	N/A	
Metadata creation	N/A	
2.2 Making data openly accessible		
Data openly accessible	N/A	
How it will be accessible	N/A	
Methods/software tools needed to access the data	<i>Wireshark or similar packet analysis software should be used to access the traffic data</i>	
Repository	N/A	
Access restrictions	N/A	
2.3 Making data interoperable		
Interoperability	N/A	
Metadata, vocabularies, and standards	N/A	

Use of standard vocabularies	N/A
Mappings to commonly used ontologies	N/A
2.4 Increase data re-use (through clarifying licenses)	
License	N/A
Available for re-use	N/A
Third party usability after the project	N/A
How long will remain re-usable	N/A
Data quality assurance process	N/A
3. Data security, archiving and preservation	
Security procedures	N/A
4. Ethics and legal compliances	
Possible ethical or legal aspects	For the specific activities in the TSN proof of concept dataset it is not expected any ethical or legal issues because it will not be collected any data from actual users but synthetic data or data acquired from the communication system without involving human data
Consent for data sharing and long-term preservation	No informed consent will not be needed for data sharing because no personal data will be collected in the dataset

4.2 Datasets for exploitation and dissemination

DATASET 04	Dataset name: Affordable5G Website
	Partner: Martel
1. Data Summary	
Purpose	The data collected from the website visitors is needed for maintaining contact, and as required by law for any legal agreement we have with them. The data and information collected are used to optimize content and performance of the website and may also be used in the event of attacks on our information technology systems.
Types and formats of data	<p>The web site collects the following data:</p> <ul style="list-style-type: none"> • User account data: i.e. account of users authorised to publish content on the web site. This are in general users' part of MARTEL and in some cases of other third parties in the Affordable5G authorised to publish news on the web site. This may include: <ul style="list-style-type: none"> - Name and relevant titles - Email - Job title - Company name - Company address (in very rare cases) • Contact data: i.e. data provided by web sites visitors filling in contact forms to request information to the Affordable5G consortia. This may include: <ul style="list-style-type: none"> - Name and relevant titles - Email - Job title - Company name

	<ul style="list-style-type: none"> - Company address (in very rare cases) • Access log data: i.e. data that are collected by servers to control access to the web pages of the web site that may be used in the event of attacks and other cases requested by the law. This may include (1) the browser types and versions used, (2) the operating system used by the accessing system, (3) the website from which an accessing system reaches our website (so-called referrers), (4) the sub-websites, (5) the date and time of access to the Internet site, (6) an Internet protocol address (IP address), (7) the Internet service provider of the accessing system, and (8) any other similar data and information that may be used in the event of attacks on our information technology systems.
Re-use of existing data	No existing data is re used.
Origin	<p>All data we store has been clearly and voluntarily provided to us by contacts and partners (subscribing to a newsletter, sending us an email, giving us their business card, answering to an online questionnaire etc.).</p> <ul style="list-style-type: none"> • The website collects a series of general data and information when a data subject or automated system calls up the website. • The website contains information that enables a quick electronic contact to the project's consortium, as well as direct communication with Affordable5G, which also includes a general address of the so-called electronic mail (e-mail address). If a data subject contacts the project by e-mail or via a contact form, the personal data transmitted by the data subject are automatically stored. Such personal data transmitted on a voluntary basis by a data subject to Martel as data owner are stored for the purpose of processing or contacting the data subject. <p>As is common practice with almost all professional websites this site also uses cookies, to improve visitors' experience. In some special cases we also use cookies anonymized provided by trusted third parties (such as Google Analytics) – More details are provided in the Cookie Policy page of Affordable5G's website: https://www.affordable5g.eu/cookie-policy/</p>
Expected size	We collect minimal data from our site visitors.
Utility	Data and information collected are needed to (1) deliver the content of our website correctly, (2) optimize the content of our website as well as its advertisement, (3) ensure the long-term viability of our information technology systems and website technology, and (4) provide law enforcement authorities with the information necessary for criminal prosecution in case of a cyber-attack.
2. FAIR data	
2.1 Making data findable, including provisions for metadata	
Is the data discoverable	N/A
Naming conventions	N/A
Keywords	N/A
Versioning	N/A
Metadata creation	N/A
2.2 Making data openly accessible	

Data openly accessible	Data collected are personal data (email address and other contact details) as such they will not be shared with any third party (openly or privately).
How it will be accessible	N/A
Methods/software tools needed to access the data	N/A
Repository	N/A
Access restrictions	<ul style="list-style-type: none"> • Only people authorised by the data owner (MARTEL) will have access to the collected data. • The data owner can authorise as data processors other project partners involved with the dissemination efforts of the project only where necessary. • Access to the web site log data occurs via username and password. Only authorised users have the access and only admins in Martel can grant access.
2.3 Making data interoperable	
Interoperability	N/A
Metadata, vocabularies, and standards	N/A
Use of standard vocabularies	N/A
Mappings to commonly used ontologies	N/A
2.4 Increase data re-use (through clarifying licenses)	
License	N/A
Available for re-use	N/A
Third party usability after the project	There will be no transfer of personal data collected to any third party.
How long will remain re-usable	<p>Martel shall process and store the personal data of the data subject only for the period necessary to achieve the purpose of storage, or as far as this is granted by the European legislator or other legislators in laws or regulations to which the Martel is subject to.</p> <p>If the storage purpose is not applicable, or if a storage period prescribed by the European legislator or another competent legislator expires, the personal data are routinely blocked or erased in accordance with legal requirements.</p> <p>The criteria used to determine the period of storage of personal data is the respective statutory retention period. After expiration of that period, the corresponding data is routinely deleted.</p>
Data quality assurance process	N/A
3. Data security, archiving and preservation	
Security procedures	<p>Users can access the website only via an encrypted connection (https), in order to add a second security layer between the user and the website itself.</p> <p>WordPress (WP) has been used to build Affordable5G's website. This content management system (CMS) uses the latest technology about PHP and MariaDB for the business logic and database respectively. WP provides</p>

	<p>al lot of plug ins in order to grant a great security both for the content and users. In fact, plug ins such as anti-spam, anti-SQL injection, anti-brute force attack etc. can help to prevent spam and the most common attacks. Moreover, WP provides different access roles, in order to grant the right permissions to the right users. Users' WP passwords are encrypted through RSA technology, so no one can decrypt them. Neither a WP administrator.</p> <p>Setting of cookies can be prevented by visitor by adjusting the settings on their browser. Disabling cookies will usually result in also disabling certain functionality and features of this site. Therefore, it is recommended for users not disable cookies.</p> <p>On this website, Martel has integrated components of Twitter: Twitter receives information via the Twitter component that the data subject has visited our website, provided that the data subject is logged in on Twitter at the time of the call-up to our website. This occurs regardless of whether the person clicks on the Twitter component or not. If such a transmission of information to Twitter is not desirable for the data subject, then he or she may prevent this by logging off from their Twitter account before a call-up to our website is made.</p>
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4. Ethics and legal compliances

Possible ethical or legal aspects	Data collected are personal data, and in compliance with GDPR can only be used for the original scope they have been collected for: informing contacts about Affordable5G. As such they will not be shared outside the parties in the consortia in charge of providing the newsletter services (so not to any external third party).
Consent for data sharing and long-term preservation	<p>The website respects the latest European laws about Privacy (GDPR). All users (registered and guests) have to authorise data collection by the data owner (MARTEL) and eventually, in the case of cookies for anonymised tracking – the sharing with a third party.</p> <p>All information is available in detail at the following URLs:</p> <ul style="list-style-type: none"> https://www.affordable5g.eu/privacy-policy/ https://www.affordable5g.eu/cookie-policy/ <p>The aforementioned Privacy Policy page also informs visitors in detail on the data subject's rights (Section 9).</p>

DATASET 05	Dataset name: Affordable5G Newsletter
	Partner: Martel
1. Data Summary	
Purpose	The personal data collected as part of a registration for the Affordable5G newsletter will only be used to verify registrations and to send our newsletter.
Types and formats of data	<ul style="list-style-type: none"> E-mail address of visitors registering to the newsletter. During the registration for the newsletter, we also store the IP address of the computer system assigned by the Internet service provider (ISP) and used by the data subject at the time of the registration, as well as the date and time of the registration.

	<ul style="list-style-type: none"> The newsletter of Affordable5G contains so-called tracking pixels. A tracking pixel is a miniature graphic embedded in such e-mails, which are sent in HTML format to enable log file recording and analysis. Based on the embedded tracking pixel, Martel may see if and when an e-mail was opened by a data subject, and which links in the e-mail were called up by data subjects.
Re-use of existing data	No existing data is re-used
Origin	The personal data is collected previous informed consent upon registration to the newsletter through the dedicated page of Affordable5G's website.
Expected size	Between 100 and 200 records
Utility	Data collected express the interest of subscribers to receive news from Affordable5G project.
2. FAIR data	
2.1 Making data findable, including provisions for metadata	
Is the data discoverable	No
Naming conventions	N/A
Keywords	N/A
Versioning	No
Metadata creation	None
2.2 Making data openly accessible	
Data openly accessible	Data collected are personal data (email address and other contact details) as such they will not be shared with any third party (openly or privately).
How it will be accessible	N/A
Methods/software tools needed to access the data	N/A
Repository	N/A
Access restrictions	<ul style="list-style-type: none"> Only people authorised by the data owner (MARTEL) will have access to the collected data. The data owner can authorise as data processors other project partners involved with the dissemination efforts of the project only where necessary. Access to the newsletter subscribers list occurs via username and password. Only authorised users have the access and only admins in Martel can grant access.
2.3 Making data interoperable	
Interoperability	N/A
Metadata, vocabularies, and standards	N/A
Use of standard vocabularies	N/A
Mappings to commonly used ontologies	N/A
2.4 Increase data re-use (through clarifying licenses)	
License	N/A

Available for re-use	N/A
Third party usability after the project	<p>We use the third-party service provider Mailchimp (The Rocket Science Group, LLC), to process and store your data: which Affordable5G uses to manage the newsletter subscriber lists and send emails to our subscribers. We don't share user's data with any other third-party.</p> <p>Affordable 5G Privacy Policy is linked from each newsletter Users data are not used after the end of the project for marketing purposes.</p>
How long will remain re-usable	<p>In compliance with GDPR, data subjects are at any time entitled to revoke the respective separate declaration of consent issued by means of the double-opt-in procedure. After a revocation, these personal data will be deleted by Martel. Martel automatically regards a withdrawal from the receipt of the newsletter as a revocation. At the end of the project, data will be deleted.</p>
Data quality assurance process	N/A
3. Data security, archiving and preservation	
Security procedures	Data are stored in a GDPR compliant newsletter service. Data are encrypted, and access to them is possible only via authentication of previously authorised users by the data owner entity (MARTEL). Authentication and access channels to the data are as well encrypted.
4. Ethics and legal compliances	
Possible ethical or legal aspects	Data collected are personal data, and in compliance with GDPR can only be used for the original scope they have been collected for: informing newsletter subscribers about Affordable5G. As such they will not be shared outside the parties in the consortia in charge of providing the newsletter services (so not to any external third party).
Consent for data sharing and long-term preservation	<p>All related information is available in detail at the following URL (on section 5 and 6):</p> <p>https://www.affordable5g.eu/privacy-policy/</p> <p>The subscription to our newsletter may be terminated by the data subject at any time. The consent to the storage of personal data, which the data subject has given for shipping the newsletter, may be revoked at any time. For the purpose of revocation of consent, a corresponding link is found in each newsletter. It is also possible to unsubscribe from the newsletter at any time by contacting Martel/Affordable5G's consortium directly via the Contact section of the website, or through the website's GDPR</p> <p>Requests page:</p> <p>https://www.affordable5g.eu/gdpr-requests/</p> <p>Furthermore, subscribers to the newsletter may be informed by e-mail, as long as this is necessary for the operation of the newsletter service or a registration in question, as this could be the case in the event of modifications to the newsletter offer, or in the event of a change in technical circumstances</p>

4.3 Datasets for project management

DATASET 06		Dataset name: Project Management
		Partner: ATOS
1. Data Summary		
Purpose	This dataset will contain administrative data for the management of the project. It will include administrative information from the partners	
Types and formats of data	<p>Word, spreadsheets, and reports.</p> <p>Contact and Admin data: i.e. data provided by partners in contact forms to request information to the Affordable5G consortia. This may include: Name and relevant titles, Email, Job title, Phone number, Company name, Company address, Bank accounts number and holders, Legal representatives, etc All management information for reporting (spent effort, expenditures, etc).</p>	
Re-use of existing data	No	
Origin	Data provided by each partner	
Expected size	kbytes	
Utility	The information within this dataset is part of the WP6 management activities.	
2. FAIR data		
2.1 Making data findable, including provisions for metadata		
Is the data discoverable	Just for consortium members and previously signed a Data Protection Consent form	
Naming conventions	The naming conventions are included in D6.1 Project handbook.	
Keywords	N/A	
Versioning	N/A	
Metadata creation	N/A	
2.2 Making data openly accessible		
Data openly accessible	No, the access is just for Consortium members	
How it will be accessible	N/A	
Methods/software tools needed to access the data	Owncloud	
Repository	Owncloud and internal ATOS systems	
Access restrictions	<p>Only people authorised by the data owner (ATOS) will have access to the collected data.</p> <p>The data owner can authorise as data processors other project partners involved with the management (i.e. WP leaders) of the project when necessary</p>	
2.3 Making data interoperable		
Interoperability	N/A	

Metadata, vocabularies, and standards	N/A
Use of standard vocabularies	N/A
Mappings to commonly used ontologies	N/A
2.4 Increase data re-use (through clarifying licenses)	
License	N/A
Available for re-use	N/A
Third party usability after the project	N/A
How long will remain re-usable	N/A
Data quality assurance process	N/A
3. Data security, archiving and preservation	
Security procedures	This information is subject to the Atos Information Security Policy, aiming at safeguarding the confidentiality, integrity, availability, authenticity and non-repudiation of information and information systems. It is based on an internationally accepted security standard (ISO27002 -, Code of Practice for Information Security Management). Atos implements technical and organizational security measures to safeguard stored personal data against inadvertent or deliberate manipulation, loss, or destruction and against access by unauthorized persons.
4. Ethics and legal compliances	
Possible ethical or legal aspects	This project repository may include personal data that by any means will not be shared outside the consortium
Consent for data sharing and long-term preservation	All partners will sign a Data Protection consent form for the use of some specific data, such as name, surname, professional email address, phone number, or skype user.

5 CONCLUSION

This document has provided the approach of Affordable5G project to deal with EU directives about data management when collecting and processing data during its execution. The document describes the research data that is being generated and the normal operative information during project execution as well as the challenges and constraints that need to be considered for managing it.

The consortium has identified a list of six datasets that cover: the two official pilots (Mission Critical Service and Smart City Edge cases), the technical TSN PoC, the normal dissemination needs (website and newsletter) and the project management activity.

A detailed FAIR questionnaire has been completed for each one to understand the origin and nature of this data, its format, associated accessibility policy and the re-usability of this information. As the project progresses with the pilot implementations and other activities, these datasets can be revisited and updated to continue fulfilling the FAIR principles. Regarding storage information, all relevant deliverables generated during the project will be stored and shared in the common repository (BSCW) of the 5G PPP community according to the collaboration principles among programme.

6 REFERENCES

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