

D8.1 Data Management Plan

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Executive Summary

The following document is the Deliverable 8.1_Data Management Plan (DMP) of the DIAMOND Project, funded by the European Union's Horizon 2020 research and innovation programme under grant agreement Number 824326.

The main aim of DIAMOND Project is to turn data into actionable knowledge with notions of fairness, in order to progress towards an inclusive and efficient transport system, by the development of a methodology based on the collection and analysis of disaggregated data, including new sources, analytics and management techniques.

This document is the first version of the DMP, consisting of preliminary information regarding the type and format of data that will be collected and generated, its origin, data utility and how DIAMOND project research data will be findable, accessible, interoperable and reusable (i.e. FAIR).

The purpose of DMP is to provide the members of the consortium with an analysis of the main elements of the data management policy regarding all the datasets generated by the project.

The DMP is a living document that will evolve during the lifespan of the project, the second version D8.1.2_Data Management Plan, revision period 1 will be published on May 31, 2020 and the third and final version D8.1.3_Data Management Plan, revision period 2 will be published by the end of project on November 30, 2021.



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Terminology and Acronyms

CCTV	Closed-Circuit Television
DMP	Data Management Plan
EC	European Commission
EU	European Union
EUT	FUNDACIO EURECAT
FAIR	Findable, Accessible, Interoperable, Reusable
FGC	Ferrocarrils de la Generalitat de Catalunya
G&V	GENRE ET VILLE
H2020	Horizon 2020
ORDP	Open Research Data Pilot
SYS	Systematica S.r.l.
VELIB	SYNDICAT MIXTE AUTOLIB ET VELIB MÉTROPOLE
WAVE	WAVE WOMEN AND VEHICLES IN EUROPE
WP	Work Package
ZTM	MIASTO STOLECZNE WARSZAWA



I. Introduction

The main purpose of the DMP is to provide the members of the consortium with an analysis of the main elements of the data management policy to be used with regard to the project research data.

The DMP is produced using the European Commission (EC) guideline of "Horizon 2020 FAIR Data Management Plan (DMP) template", Version: 26 July 2016. It covers the entire research data life cycle as it is shown in the following figure that illustrates the different phases and aspects of research data management and their relation.

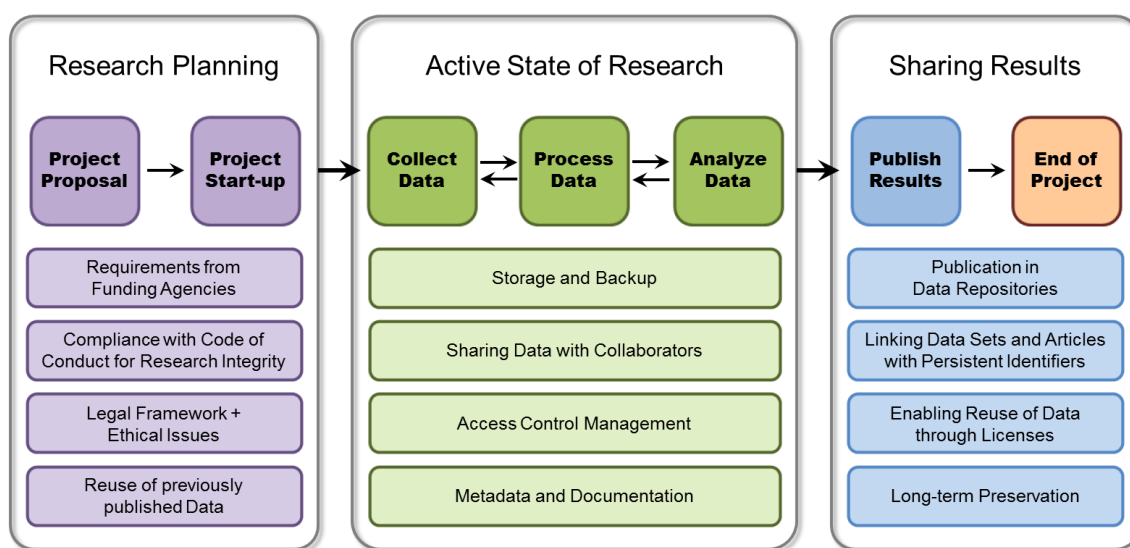


Figure 1. Data Life Cycle¹

It is noteworthy that in reality, research processes are rarely as linear as shown here but the model summarizes the most important aspects of data management at different phases of the project.

The DMP provides information regarding purpose of data collection, type and format of data collection and generation, methods of re-using existing data, origin of data, expected size of data, data utility, how DIAMOND project research data will be findable, accessible, interoperable and reusable (FAIR), data security and ethical issues.

As this document is the first version of the DMP, delivered in Month 6 of the project, it only provides a general overview of data collection. The upcoming versions of the DMP will be more detailed and describe the practical data management procedures implemented by the DIAMOND project. The DMP will be updated in Month 18 (D8.I.2) and Month 36 (D8.I.3) respectively.

¹ SOURCE: HÜSER, FALCO JONAS; ELBÆK, MIKAEL K.; MARTINEZ LAVANCHY, PAULA (2016): DTU RESEARCH DATA LIFE CYCLE. FIGSHARE. FIGURE.



2. Data summary

2.1 What is the purpose of the data collection/generation and its relation to the objectives of the project?

The purpose of data collection campaigns of DIAMOND project is to collect quantitative and qualitative data regarding the participation of women in the transport sector both as users and job holders mainly across the eight countries of the members of the consortium. The data collection campaigns will comply with the EU ethics and legal requirements as well as national ethics and legal requirements.

Access to the collected data is necessary in order to reach the main objective of the project mentioned in "Grant Agreement, Number 824326 — DIAMOND" and listed below:

To turn data into actionable knowledge with notions of fairness, in order to progress towards an inclusive and efficient transport system.

As well as following specific objectives mentioned in the grant agreement and listed below:

- Develop a conceptual framework for effective data collection in order to advance the understanding on women's needs, motivations and expectations on upcoming business and operational transport models and technologies
- Identify and actively tackle gaps and opportunities for future inclusive transport systems
- Build new comprehensive sets of disaggregated data with demographic and behavioural variables in mobility and transport scalable to population specificities
- Carry out interdisciplinary data analysis to identify present and future behaviour patterns, gaps and opportunities for inclusive mobility and transport systems, including definitions of fairness
- Turn Knowledge into actionable tools by delivering new personalized tools for self-diagnose, decision support systems and modelling tools for the suggestion of inclusive measures
- Validate the different tools included in different use-cases (efficiency, effectiveness, impact, scalability, acceptance, replicability in different transport modes, etc.)
- Prove the value of integrating new data sets into transport and mobility operations and businesses for an inclusive and sustainable transport management, by measuring its impact on transport organizations
- Replicate and generate new business opportunities, by showing examples of successful cases implemented in the project that could be translated into other modes of transport/sectors
- Address Women needs as user of transport; as consumer of new services; as jobholder, considering the woman as Polyhedral Individual with multiple characteristics: age, ethnic origin, social level, education, family composition, sexual identity and orientation, etc., in all her life stages, to avoid inequalities in transport opportunities
- Generate and disseminate recommendations and protocols for a fair inclusive transport with the aim of engaging the transport community, public authorities, educational communities and society at large



- This will allow evidence of a novel methodological approach and new datasets to address fairness, and to implement new educational resources and strategies for fairness management
- Developments and challenges related to inclusive mobility and related needs for skills and opportunities for professional careers will be reflected
- Lay the ground for knowledge co-creation by enabling participatory processes in knowledge building where participants provide their input, enabling an open, anonymous and wide co-creation process.

2.2 What types and formats of data will the project generate/collect?

2.2.1 Type of data

The DIAMOND project will collect and produce a wide range of both quantitative and qualitative data for four different use-cases which are summarized below. Note that the list is subjected to modifications, including addition or removal of datasets and their content in the later versions of DMP depending on the project developments.

Data Set for use-case	Information contained in Datasets and aims
1- Public transport infrastructure-Railways	<ul style="list-style-type: none"> • Specific transport requirements (service supply, infrastructure/vehicle design, safety and security issues...) considering the service, the station design and the vehicles, crossing with gender, age, social level, education, ethnic origin, family composition, sexual identity and orientation, etc., and of their influence on urban mobility needs. • Opinions and attitudes, and aptitude in using access to public transport, including pre-processed and aggregated data from social media, surveys etc. in order to detect inequalities in accessing to public transport and address them.
2- Vehicle Dynamics control/ADAS	<ul style="list-style-type: none"> • Vehicle design, safety, comfort and security issues crossed with gender, age, social level, education, ethnic origin, family composition, etc. including pre-processed and aggregated data from social media, and with data from tests in simulators, to assess their influence on private vehicle needs
3- Vehicle sharing fleet management	<ul style="list-style-type: none"> • Gender Impact Assessment of business/operational models (car sharing) and the involved technology e.g. booking thorough App, battery charging etc., crossing with gender, age, social level, education, ethnic origin, family composition, sexual identity and orientation, etc. to assess their influence on women choices and preferences • Opinions, attitudes and aptitude in using new technologies, crossing with gender, age, social level, education, ethnic origin, family composition, sexual identity and orientation, etc., including pre-processed and aggregated data from social media, to assess women



	influence on technologies and business models, detect inequalities in tackling new opportunities and address them.
	<ul style="list-style-type: none"> • New technologies and business models, crossed with opinions, attitudes and aptitude in using new technologies according to gender, age, social level, education, ethnic origin, family composition, sexual identity and orientation, etc., aiming at adaptation of new technologies and business models to women’s needs
4- Women recruitment in railways and freight	<ul style="list-style-type: none"> • Needs and motivations for jobs in transport crossing with gender, age, social level, education, ethnic origin, family composition, sexual identity and orientation, etc. • Future needs for skills in professional careers, such as railway operator, train driver and Dangerous Goods truck driver, crossing with women motivations and talent in new technologies, job characteristics, etc., to match job opportunities in current and future transport systems and identify needs for new educational contents.

Table 1. List of DIAMOND project data sets for each use-case

2.2.2 Format of data

The collected and generated data will be stored in several formats including documents, images, videos, data, numerical codes, maps, AutoCAD drawings and 3D imagery and models.

The following table provides an overview of possible file types for sharing, reuse and preservation based on the UK Data Archive². DIAMOND recommends avoiding the use of propriety software formats where possible.

Type of data	Acceptable formats for sharing, reuse and preservation	Other acceptable formats for data preservation
Tabular data with extensive metadata variable labels, code labels, and defined missing values	SPSS portable format (.por) delimited text and command ('setup') file (SPSS, Stata, SAS, etc.) structured text or mark-up file of metadata information, e.g. DDI XML file	proprietary formats of statistical packages: SPSS (.sav), Stata (.dta), MS Access (.mdb/.accdb)

²<https://www.ukdataservice.ac.uk/manage-data/format/recommended-formats>



<p>Tabular data with minimal metadata</p> <p>column headings, variable names</p>	<p>comma-separated values (.csv)</p> <p>tab-delimited file (.tab)</p> <p>delimited text with SQL data definition statements</p>	<p>delimited text (.txt) with characters not present in data used as delimiters</p> <p>widely-used formats: MS Excel (.xls/.xlsx), MS Access (.mdb/.accdb), dBase (.dbf), OpenDocument Spreadsheet (.ods)</p>
<p>Geospatial data vector and raster data</p>	<p>ESRI Shapefile (.shp, .shx, .dbf, .prj, .sbx, .sbn optional)</p> <p>geo-referenced TIFF (.tif, .tfw)</p> <p>CAD data (.dwg)</p> <p>tabular GIS attribute data</p> <p>Geography Markup Language (.gml)</p>	<p>ESRI Geodatabase format (.mdb)</p> <p>MapInfo Interchange Format (.mif) for vector data</p> <p>Keyhole Mark-up Language (.kml)</p> <p>Adobe Illustrator (.ai), CAD data (.dxf or .svg)</p> <p>binary formats of GIS and CAD packages</p>
<p>Textual data</p>	<p>Rich Text Format (.rtf)</p> <p>plain text, ASCII (.txt)</p> <p>eXtensible Mark-up Language (.xml) text according to an appropriate Document Type Definition (DTD) or schema</p>	<p>Hypertext Mark-up Language (.html)</p> <p>widely-used formats: MS Word (.doc/.docx)</p> <p>some software-specific formats: NUD*IST, NVivo and ATLAS.ti</p>
<p>Image data</p>	<p>TIFF 6.0 uncompressed (.tif)</p>	<p>JPEG (.jpeg, .jpg, .jp2) if original created in this format</p> <p>GIF (.gif)</p> <p>TIFF other versions (.tif, .tiff)</p> <p>RAW image format (.raw)</p> <p>Photoshop files (.psd)</p> <p>BMP (.bmp)</p> <p>PNG (.png)</p> <p>Adobe Portable Document Format (PDF/A, PDF) (.pdf)</p>
<p>Audio data</p>	<p>Free Lossless Audio Codec (FLAC) (.flac)</p>	<p>MPEG-1 Audio Layer 3 (.mp3) if original created in this format</p> <p>Audio Interchange File Format (.aif)</p> <p>Waveform Audio Format (.wav)</p>
<p>Video data</p>	<p>MPEG-4 (.mp4)</p>	<p>AVCHD video (.avchd)</p>



	OGG video (.ogv, .ogg) motion JPEG 2000 (.mj2)	
Documentation and scripts	Rich Text Format (.rtf) PDF/UA, PDF/A or PDF (.pdf) XHTML or HTML (.xhtml, .htm) OpenDocument Text (.odt)	plain text (.txt) widely-used formats: MS Word (.doc/.docx), MS Excel (.xls/.xlsx) XML marked-up text (.xml) according to an appropriate DTD or schema, e.g. XHTML 1.0

Table 2. File formats recommended and accepted by the UK Data Service for data sharing, reuse and preservation

2.3 Will you re-use any existing data and how?

The qualitative data collection is from partner's user subscriptions such as VELIB, FGC, ZTM, G&V, WAVE etc. In addition, partners such as FGC and ZTM will provide data regarding the design of the train stations, locations of CCTV cameras, lighting, toilets, etc. when available. The consortium will also take into consideration the possibility to gather data from other source, such as ongoing or completed EU H2020 Projects (e.g., TInnGO project and MoTIV project).

2.4 What is the origin of the data?

The four main source of data collection for the DIAMOND project are:

1. Data collection through surveys:

Surveys and online questioners of minimum 300, ideally 500 from at least the 8 countries represented in the consortium with overall 10,000 participants expected.

Through existing surveys from partners that are transport authorities themselves (e.g. service satisfaction surveys from FGC, etc.).

2. Data obtained from social media:

Data will be generated by over 100.000 posts from at least 10.000 users of social networks (e.g. data geolocation from tweets, etc.), according to ethic clearance. It will also take into consideration the possibility to analyse those web-based data coming from the visitors of the DIAMOND website and Twitter profile (i.e. analytics).

3. Open transport network data, open location-based data, etc.

4. Data from partners' subscriptions (users of VELIB, FGC, ZTM, G&V, WAVE etc.).

Partners' databases may provide other information for the studies such as gender, age, family status etc.

2.5 What is the expected size of the data?

The expected size of data will be identified in the next version of this report (DMP) after the conclusion of Task 3.4 Data collection campaigns.



2.6 To whom might it be useful ('data utility')?

The data collected and generated by the DIAMOND project is useful for a wide spectrum of stakeholders that are working in transport and gender related issues, including the following five main groups:

- Government / Authorities
- Business / Operators
- Associations / Advocates
- Scientific, academic and educational community
- Society in general

The following table provides details of the targeted users for each stakeholder group that will benefit from the data collected and generated by DIAMOND project.

Stakeholders' groups	Targeted users
Government Authorities	/ Elected officials at EU, national, regional and local level Policy makers at EU, national, regional and local level Transport planners and strategists Public transport operators and transport organisers HR managers, health and safety Traffic police, emergency services
Businesses / operators	Public or private transport operators/ service providers Vehicle manufacturers and their providers (Tier I) Car-sharing companies Bicycle rental operators New mobility services providers/start-ups Transport consultants Data specialists and technology consultants Engineering and infrastructure design companies Head-hunters, HR agencies Insurance companies
Associations and advocates	Transport-related associations/advocates Gender-related associations/advocates Trade unions
Scientific, academic and educational community	Research institutions in transport, gender, sociology-related areas



	Decision-makers and HR staff from universities, vocational / training centres
Society in general	<p>Communities (local interest groups, cycling/walking groups, public transport user groups, local authority forums)</p> <p>Transport or gender-related NGOs</p> <p>Media, bloggers</p> <p>Individual citizens</p>

Table 3. Detail of targeted users benefiting from DIAMOND project

3. FAIR data

3.1 Making data findable, including provisions for metadata

3.1.1 Metadata provision

Data will be stored at a cloud-based repository and will be kept for 2 years after the end of the project. Where requested, data will be kept for 2 more years, accessible for third parties to access, mine, exploit, reproduce and disseminate, free of charge. Strong file-naming conventions and versioning applications will be of use to make data findable.

3.1.2 Standards for metadata creation

Data will only be shared out with the consortium in relation to publications (deliverables and papers). Considering publication will be the main piece of metadata for the shared data. The bibliographic metadata will be in a standard format and will include all 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.

3.2 Making data openly accessible

The full dataset will be available to the members of the consortium. The following tables provides the complete list of DIAMOND project deliverables and their respective dissemination level as described in the grant agreement including both reports and Open Research Data Pilot (ORDP). The front page and executive summary will be published in the project website for all deliverables. There are no Deliverables considered as classified.

WP No	Deliverable No	Title	Nature	Dissemination level
WPI	DI.1	Project administrative toolset	Report	Confidential, only for members of the consortium (including the



				Commission Services)
WP1	D1.2	Project quality plan	Report	Confidential, only for members of the consortium (including the Commission Services)
WP1	D1.3	Project Communication plan	Report	Public
WP2	D2.1	Use-cases definition	Report	Confidential, only for members of the consortium (including the Commission Services)
WP2	D2.2	Methodology and Conceptual framework	Report	Confidential, only for members of the consortium (including the Commission Services)
WP3	D3.1	Methodology and requirements for data collection	Report	Confidential, only for members of the consortium (including the Commission Services)
WP3	D3.2	User engagement strategy	Report	Confidential, only for members of the consortium (including the Commission Services)
WP3	D3.3	Report on data collection campaigns	Report	Public
WP4	D4.1	Datasets description	Other	Public
WP4	D4.2	Socio-economic, demographic and psychological analysis for women in transport related choices (transport modalities and jobs)	Report	Public



WP4	D4.3	Computational analysis report	Report	Public
WP4	D4.4	Integrated interdisciplinary analysis report	Report	Public
WP5	D5.1	Architecture design	Report	Confidential, only for members of the consortium (including the Commission Services)
WP5	D5.2	Toolbox source code	Other	Confidential, only for members of the consortium (including the Commission Services)
WP6	D6.1	Report on the testing of the toolbox in the studied use-cases	Report	Confidential, only for members of the consortium (including the Commission Services)
WP6	D6.2	Evaluation and validation of fairness	Report	Confidential, only for members of the consortium (including the Commission Services)
WP7	D7.1	First Impact assessment report	Report	Public
WP7	D7.2	Interim Impact assessment report	Report	Public
WP7	D7.3	Final Impact assessment report	Report	Public
WP8	D8.1	Data Management Plan	ORDP	Public
WP8	D8.2	Data Management Plan revision period 1	ORDP	Public
WP8	D8.3	Data Management Plan revision period 2	ORDP	Public
WP8	D8.4	A Guide to interview ethics	Report	Public



WP8	D8.5	DIAMOND RRI and legal first year report	Report	Public
WP8	D8.6	DIAMOND RRI and legal second year report	Report	Public
WP8	D8.7	DIAMOND RRI and legal final report	Report	Public
WP9	D9.1	CSR protocols	Report	Confidential, only for members of the consortium (including the Commission Services)
WP9	D9.2	Educational curriculum design guidelines	Report	Public
WP9	D9.3	Guidelines for vehicle dynamics	Report	Confidential, only for members of the consortium (including the Commission Services)
WP9	D9.4	DIAMOND White Paper for a fair, inclusive and women-participated mobility and transport system	Report	Public
WP9	D9.5	First year dissemination and exploitation report	Report	Confidential, only for members of the consortium (including the Commission Services)
WP9	D9.6	Second year dissemination and exploitation report	Report	Confidential, only for members of the consortium (including the Commission Services)
WP9	D9.7	Final dissemination and exploitation report	Report	Confidential, only for members of the consortium (including the Commission Services)



				Commission Services)
WP9	D9.8	Innovation Management outcomes analysis	Report	Confidential, only for members of the consortium (including the Commission Services)
WPI 0	D10.1	NEC - Requirement No. 1	Ethics	Confidential, only for members of the consortium (including the Commission Services)

Table 4. List of DIAMOND project deliverables and their dissemination level

In addition, articles published in open access scientific journals, workshops and conference abstracts/articles will be available for free access through the project website.

3.3 Making data interoperable

The concept interoperable demands that both data and metadata must be machine-readable and that a consistent terminology is used. The Data Managing team will ensure also the increase of data re-use through open or non-proprietary formats and licences.

4. Allocation of resources

Systematica (SYS) will manage the data repository in collaboration with Eurecat (EUT). The cost related to the data management operation will be defined in the next version of this document.

5. Data security

The DIAMOND project intends to collect and process specific data sets in order to develop the previously mentioned objectives, proposed studies and tools. Considering the possibility of collecting personal data, sensitive personal data and/or confidential private information for the purpose of the project, all processing will have to be conducted securely as per current General Data Protection Regulations (GDPR) (EU, 2016/679). Transfer of data will be via a Zip process of distribution and Data Owner/Data Provider is responsible for the anonymization process and for ensuring that identifiable variables are not transferred to the repository.

6. Ethical issues

The consortium is aware that several privacy and data protection issues could be raised by the activities regarding surveys and interviews that requires human participation and data collection from social media. These activities will be done in full compliance with all European and national legislation and directives relevant to the country and organisation where the data collections are taking place, and about all the guidelines provided in D8.2 A Guide to interview ethics as part of WP8_ Ethical, legal and data management aspects of DIAMOND project. Data will be anonymised,



to protect any sensitive information about the users and in order not to have any potential ethical issues with their publication and dissemination, according to Article No. 8 and No. 13 of the GDPR - General Data Protection Regulation (EU, 2016/679).

To ensure this all participants will be made fully aware that their involvement requires the submission of an Informed Consent Form, prior to their participation.

The Data Owner/Data Provider is responsible for the anonymization process and for ensuring that identifiable variables are not transferred to the repository as per GDPR requirements. Directly identifiable variables include - but are not limited to - national ID number, name, phone number, ZIP-code, e-mail address, home address, geographical coordinates (at a resolution that risks identification).

6.1 Gender Analysis and Commitment to the Responsible Research Innovation (RRI) Principles

The DIAMOND Project will act in compliance and accordance to the best practices and principles of the RRI-Responsible Research and Innovation, in particular in relation to the following aspects:

1. **Governance:** The governance of the Project will address the responsibility of the Research Team in the design and execution of the research activities, with particular reference to prevent potential harmful or unethical developments.
2. **Public engagement:** As for the other RRI dimensions, see further details in section 5.1 on how DIAMOND will address ethical aspects in research. DIAMOND's plan for public engagement includes the dissemination and communication activities, user engagement (task 3.3) and their involvement in the co-design of the solution (WP2, WP3, WP4, WP5) and its testing and validation (WP6). These plans also involve the External Advisory Board (see section 3.2.1) and supporting organisations. Moreover, the application of the Dynamic Argumentative Delphi (DAD) method will be used as a means for public engagement during and beyond the project frame. DIAMOND outputs will be made available open access (see 2.2). This includes training materials (T9.3) that will be used by educators in transport education initiatives. From these crosscutting activities, the project will distil in deliverables D8.2, D8.3, D8.4 and in the Periodic Reports insights that may lead to improved RRI governance models and for the integration of its dimensions.
3. **Open access:** the materials, raw data and results of the Project will be preferably published on peer-reviewed scientific research papers by using open access platforms, such as OpenAIRE (Open Access Infrastructure for Research in Europe). This will guarantee free online access to publications for the end-users (free of charge to read, download, copy, distribute and search content), accelerating dissemination and scientific progress.
4. **Sex and gender equity and analysis:** All partners have in operation instances of measures for (i) ensuring equal opportunities in relation to HR processes (e.g. recruitment, training, promotion, work-life balance, etc.), (ii) addressing gender-related biases and under-representation; and, (iii) carrying out gender-sensitive research and innovation by promoting a balanced gender composition of the staff working in projects. As a result, even when men traditionally cover the areas of innovation related to DIAMOND,



representatives of both genders will work under the supervision of the female DIAMOND Project Manager. Consistent with the above, DIAMOND will carry out gender-sensitive analysis and design by acknowledging gender in every aspect of the analysis formulation, methodology, and outcome planning. The main addressable gender-related issues in the project are the consideration of Gender balanced end-user target groups for designing and validating the solution. Starting from the need for more inclusive transport systems, women will be placed at the centre of the study, as users of transport and jobholders; and as transport planners, transport design and job hiring decision makers. However, representatives of involved stakeholders, transport users and jobholders in the data collection, testing and validation activities of the DIAMOND solutions will be selected taking into account the whole Gender, not only women, so as to avoid gender-based biases that may be created by only focusing on women's needs. DIAMOND aims at involving >40/60 of both genders.

5. **Ethics:** The research will be carried out in accordance with the ethical standards of the Declaration of Helsinki and of the Oviedo Convention and will be evaluated by the Ethical Committee of the DIAMOND project, whose approval is necessary for carrying on the activities. Moreover, concerning the protection and safety of the staff involved in this project, the partners involved in the project comply the appropriate health and safety procedures in conformity to the relevant European and national legislation. The project data will be treated in compliance with the National Data Protection Authority and with the EU General Data Protection Regulation. Informed consent from participants will be requested after informing about the goals of the project and the details of the questionnaires administered. The consent will be voluntarily and renegotiable, so that participants will be able to withdraw at any stage of the research process. The project's privacy policy will be also communicated to participants in order to inform them about what data will be collected, why it will be collected, who will be responsible for it and what the research team will do with it.
6. **Recruitment:** All recruitment procedures will be carried out in full compliance with the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers. Each member of the research team has vast experience in recruitment and will be responsible for the proper announcement.

