

# MARIE SKŁODOWSKA-CURIE FUTURE ROADS FELLOWSHIPS (FUTUREROADS)

## Guide for Applicants

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*Photo: Civil Engineering Building, University of Cambridge*



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**Disclaimer**

This guide aims to assist potential applicants. It is provided for information purposes only.

## Contents

1. About the University of Cambridge and FUTUREROADS partner organisations	6
2. Facilities	9
3. The Fellowship programme	10
3.1. Programme aim	10
3.2. Type and duration of the fellowship	11
3.3. What is included	11
3.4. Process	12
3.5. Cohort start dates	13
3.6. Additional information on MSCA COFUND Fellowships	13
4. Who can apply and when	13
4.1. Who can apply – eligibility	13
4.2. When to apply	14
5. Your application – how to apply	14
5.1. Overview	14
5.2. Completing proposed project information	16
5.2.1. Research theme	16
5.2.2. Primary academic disciplines areas	16
5.2.3. FUTUREROADS challenge	16
5.2.4. Project title	16
5.2.5. Name of eligible primary supervisor	16
5.2.6. Keywords	17
5.2.7. Abstract	17
5.2.8. Proposed international networking and industry secondments/short visits	17
5.2.9. Optional additional budget request	18
5.2.10. Project description & plan	18
5.2.11. Declarations	19
5.2.12. Referee details	19
5.3. Supporting documents	19
5.3.1. Cover letter, CV, degree certificates and publication list	19
5.3.2. Degree certificates	20
5.3.3. Ethics	20
6. General submission requirements	20
7. Assessment criteria	20

8.	Selection timeline	21
9.	Working in Cambridge	21
9.1.	Employment and benefits	21
9.1.1.	Equality of Opportunity at the University	22
9.1.2.	Information if you have a Disability	23
9.2.	Life at Cambridge	23
9.3.	Assistance	23
9.4.	Further information	24
	Appendix A –Training programme details	25
	Appendix B – project description & plan template	28
	Appendix C – Ethics Form	33

#### Revision Summary

Date	Revision History	Revision Class	Comments
01/12/2021	1.0	Major	Initial Availability
14/12/2021	2.0	Minor	Formatting adjusted on table 3, added revision table
11/02/2022	3.0	Major	Referee details, p. 15
28/06.2022	4.0	Major	Update for cohort 2 recruitment
16/03/2023	5.0	Major	<ul style="list-style-type: none"> <li>- Updated list of Industry partners and Supervisor for Data Science in section 1 <b>About the University of Cambridge and FUTUREROADS partner organisations</b>,</li> <li>- Updated Cohort 3 recruitment dates across the document,</li> <li>- Updated section <b>3.2.Type and duration of the fellowship</b>, introduced the end of the offered fellowships to match the end of the programme,</li> <li>- Updated section <b>3.3. What is included</b>, revised description of allowances and expenses available to the researcher,</li> </ul>

			<ul style="list-style-type: none"> <li>- Updated section <b>3.4. Process</b>, updated threshold percentage and introduced preferences among research themes,</li> <li>- Introduced section <b>3.6. Additional information on MSCA COFUND Fellowships</b></li> <li>- Updated section <b>4. Project description &amp; plan</b>, added short guidance to applicants</li> <li>- Updated section <b>5.2.5. Name of eligible primary supervisor</b>, replacement for Data Science supervisor</li> <li>- Updated section <b>5.2.10. Project description &amp; plan</b>, added reference to the assessment criteria</li> <li>- Update of <b>Appendix B</b>.</li> </ul>
09/05/2023	6.0	Minor	<ul style="list-style-type: none"> <li>- Updated section <b>3.4. Process</b>, updated preferences among research themes.</li> <li>- Updated section <b>3.5. Cohort start dates</b> with the updated number of fellowships in Cohort 2.</li> </ul>

## 1. About the University of Cambridge and FUTUREROADS partner organisations

FUTUREROADS is hosted by the University of Cambridge (UOC). UOC is a collegiate research university in Cambridge, United Kingdom. It was founded in 1209 and is the world's fourth-oldest surviving university. Cambridge is formed from a variety of institutions which include 31 semi-autonomous constituent colleges and over 150 academic departments, faculties and other institutions organised into six schools. UOC provides Future Roads fellows with a thriving research environment, strong connections to industry and a strong international network. UOC is consistently ranked in the top 10 universities in the world.

The Fellowship's founding partner organisations are Costain Ltd (COS) and the National Highways (NH). COS is a large international infrastructure engineering and technology organisation based in the UK and formed over 150 years ago. COS works across a range of sectors with a global supply chain, and collaborates with businesses in many countries, including: La Farge, Vinci, Holsim and BASF. NH is a government company established in 2015 and charged with operating, maintaining, and improving England's motorways and major A roads. NH is responsible for 4,300 miles of roads in England. These roads carry a third of all traffic by mileage and two thirds of all heavy goods traffic. NH's strategic framework will deliver £27 billion of investment on the English road network from 2020-2025, as described in the government's Road Investment Strategy. NH's strategy and the efficient and sustainable operation of the road network form the economic backbone of the UK and support economic growth.

The partnership has expanded to include:

### Industry Partners

AECOM Ltd

AECOM are an infrastructure consulting firm spanning transportation, buildings, water, energy and the environment. <https://aecom.com/>  
Amey is an infrastructure services and engineering company. Part of the Ferrovial family.  
[www.amey.co.uk](http://www.amey.co.uk)

Amey OW Ltd

Atkins Ltd

Atkins is a design, engineering and project management consultancy.

Balfour Beatty Civil Engineering Limited

<https://www.atkinsglobal.com/>  
Balfour Beatty is an international Infrastructure group. <https://www.balfourbeatty.com/>

BAM Nuttall Limited

Part of Royal BAM Group, civil engineering contractors. <https://www.bamnuttall.co.uk/>

Bentley Systems (UK) Ltd

Infrastructure and engineering software solutions. <https://www.bentley.com/en>

Keltbray Holdings Limited

Keltbray are construction engineering specialists in the infrastructure sector. <https://www.keltbray.com/>

L Lynch Plant Hire and Haulage Ltd

L Lynch Plant Hire & Haulage provides UK-wide operated and self-drive plant hire, haulage and transport services to a variety of sectors within construction. <https://l-lynch.com/>

Ordnance Survey Ltd

OS create, maintain and distribute detailed location information for Great Britain.  
<https://www.ordnancesurvey.co.uk/>

## Industry Partners

Ramboll U.K.

Ramboll is a global architecture, engineering and consultancy company founded in Denmark in 1945. <https://uk.ramboll.com/>

Ringway Infrastructure Services Ltd

Ringway deliver specialist highway services across the largest highways maintenance portfolio within the UK. <http://www.ringway.co.uk/>

SAP (UK) Ltd

SAP is one of the world's leading producers of software for the management of business processes. <https://www.sap.com/uk>

Telent Technology Services Limited

Telent is a leading technology company and specialist in the design, build, support and management of the UK's critical digital infrastructure. <https://telent.com/>

TRL Limited

TRL is a global centre for innovation in surface transport and mobility. <https://trl.co.uk/>

Cambridge Graphene Ltd (Versarien)

Versarien utilise proprietary materials technology to create innovative engineering solutions. <https://www.versarien.com/>

Galliford Try

Galliford Try is one of the UK's leading construction groups, working to improve the UK's built environment and delivering lasting change for the communities we work in.

<https://www.gallifordtry.co.uk/>

Trimble Europe B.V.

As a global supplier of solutions and services, Trimble manages fulfillment and operations worldwide through TEBV, a wholly-owned subsidiary of Trimble.

<https://www.trimble.com/en/our-company/about/tebv-europe>

Kier Highways Ltd

Kier's purpose is to sustainably deliver infrastructure which is vital to the UK.

<https://www.kier.co.uk/expertise/highways/>

Jacobs UK Ltd

Jacobs is one of the world's largest and most diverse providers of technical, professional, and construction services, including all aspects of project delivery, design, engineering, operations and maintenance.

<https://www.jacobs.com/>

Colas Ltd

Colas Ltd is an award-winning business, delivering sustainable solutions for the UK's transport infrastructure. Colas Ltd invest, design, manufacture, construct, maintain and operate a wide variety of projects for the public and private sector clients. Colas Ltd is part of the International Colas Group, whose world-class Research and Development facilities give clients access to innovative new products, processes, and ideas.

<https://www.colas.co.uk/>

Ferrovial Construction (UK) Ltd

Ferrovial Construction is a construction company based in the United Kingdom and Ireland, internationally recognized for the ability to design

## Industry Partners

Arcadis Consulting (UK) Limited

and develop unique projects, particularly large transportation infrastructure.  
<https://www.ferrovial.com/en-gb/f-construction/>  
 Arcadis is the world's leading company delivering sustainable design, engineering, and consultancy solutions for natural and built assets.  
<https://www.arcadis.com/en-gb>

The partners are actively engaged in all aspects of the programme, from recruitment to training, supervision and communications. Future Roads fellows will enable the fellows to expand their research skills by allowing them to propose their own research projects and to then collaborate with academics at the UOC, practitioners at industry partners, and academics/practitioners internationally during short visits and secondments.

The table below outlines the list of the FUTUREROADS confirmed supervisors. Additional supervisors will be invited to participate in supervision teams as needed, to reflect the needs of the fellows' applications.

Supervisor / Partner	Journal/Conference Publications / Citations / h-index; or Expertise highlights
Ioannis Brilakis, Laing O'Rourke Professor / UOC / Digital Twins	80/140 publications / 7,242 citations / h-index=45 / 15 years experience in academia
Abir Al-Tabbaa, Professor / UOC / Smart Materials	200/200 publications / 10,627 citations / h-index=59 / 28 years experience in academia and ~4 years in industry
Fumiya Iida, Professor / UOC / Automation & Robotics	71/68 publications / 6,563 citations / h-index=39 / 12 years experience in academia
Lavindra De Silva, Principal Research Associate in Digital Roads / UOC / Data Science	60+ publications / 1300+ citations / h-index=21 / 9 years in academia, 4 years in national research institute
Kristen MacAskill, Assistant Professor / UOC / Sustainability	11/7 publications / 189 citations / h-index=8 / 4 years in industry before returning to academia
Peter Ruff, Group Head BIM & Digital / COS	7 years in a BIM-focussed role at COS, preceded by construction project management roles
James Edwards, Systems Engineer / COS / Data science	10+ years' experience in systems engineering, PhD
Paula Gough, strategic lead for road transport / COS / cross-cutting	17+ years' international experience engineering and programme management
Kum Wah Choy, Chief Engineer / COS / Smart Materials & Automation	10+ years in the infrastructure sector, leader in the field of clean, connected and automated mobility, PhD
Tim Hall, Artificial Intelligence Lead / COS / Data science	30+ years in the infrastructure sector, now leading COS's AI strategy roll-out
Bhavika Ramrakhyani, Head of Materials / COS / Smart Materials	Leading COS's innovation in materials and developing solutions for the net zero agenda
Phillip Proctor, Head of Research / NH / Automation & Robotics	21 years in R&D and technology transfer; deputy Chair of the IET Transport Sector Committee



Vivi Michalaki, Future Technologies Team Leader / NH / Data Science	8 years in R&D for road operations and skilled in intelligent mobility systems
Chrysoula Litina / Principal Research Engineer / NH / Smart Materials	10 years' experience in smart materials, particularly in self-healing of smart concrete
Esther Gordon-Smith, Benefits Manager / NH / Sustainability	12 years' experience in multidisciplinary complex infrastructure projects, chartered civil engineer, benefits and legacy lead on the A303 Stonehenge
Please note this list is subject to change, but gives applicants an indication of the expertise available to them. Other nominated industry partner names forthcoming.	

*Table 1 FUTUREROADS Confirmed Supervisors*

## 2. Facilities

All fellows will be housed together in the Civil Engineering building at the UOC, to allow them to network and collaborate with each other regardless of which department their supervisors work for. The building is the home of the UKCRIC National Research Facility for Infrastructure Sensing. It accommodates purpose-built facilities to enable cutting edge research in the development and application of novel sensor systems at a range of scales. Details are available here: <https://www.nrfis.cam.ac.uk/facilities>.

The Construction IT laboratory is one of the labs hosted by the NRFIS. It is a 60 m<sup>2</sup> fully equipped laboratory for conducting geometry generation experiments. It contains a range of geometry and visual data capture sensors, 32TB of intranet NAS storage, two virtualisers and virtual reality accessories for visualising and interacting with the data along with a Microsoft HoloLens for mobile mixed reality, a drone space and three lab-scale photorealistic infrastructure test beds for preliminary experiments.

A description of the university's HPC services are here: <https://www.hpc.cam.ac.uk/>. The supercomputers they offer access to are here: <https://www.hpc.cam.ac.uk/high-performance-computing>. Our main two supercomputers are [Peta4](#) and [Wilkes2](#) - collectively known as the Cambridge Service for Data-Driven Discovery (CSD3). Access to CSD3 is available to users from the University of Cambridge, other academic institutions, or industry. Researchers at the University of Cambridge (and affiliated institutions in Cambridge) are eligible for a limited allocation of free time on the system. Paid access to CSD3 system is available to any user, whether from the University of Cambridge, another academic institution or industry, under a simple pay-for-use mechanism. Please refer to the website for further details.

The Civil Engineering division also has facilities across many other university buildings. These include laboratories and facilities at the main Department of Engineering Trumpington Street site such as:

- Geotechnical and Infrastructure Materials Laboratory. This laboratory is equipped with a wide range of state-of-the-art facilities, equipment and instrumentations for the synthesis, characterisation, benchtop testing, instrumentation and large-scale laboratory testing of a wide range of conventional and innovative infrastructure materials and products.
- Bio-lab. A laboratory tailored for microbial-based treatment and testing on infrastructure materials.

The Civil Engineering division facilities also include the Schofield Geotechnical Centrifuge Centre. This is a building that houses the famous Cambridge centrifuge as well as many full-scale testing facilities including a full-scale fully instrumented pavement tester as well as a range of other facilities for testing pavement materials at different scales.

Further details can be found at: <https://www-geo.eng.cam.ac.uk/>.

Other facilities that belong to the civil engineering division on advanced materials are also situated in the Nanoscience centre and IfM. The field of smart materials is a main area of research across many departments within the university. There are many instruments and facilities within the Department of Materials Science and the Henry Royce Centre facilities located within at the Maxwell Centre building that are available to the wider university research community and can be booked for use, usually for a fee.

The main Engineering Trumpington site also houses the Bio-Inspired Robotics Laboratory to accommodate many experimental robotics research projects: <http://birlab.org/> The Trumpington site also hosts the Observatory for Human Machine Collaboration, a shared experimental lab space for interdisciplinary collaboration projects on the research topic of Human Machine Collaboration: <https://www.ohmc.group.cam.ac.uk>

The Trumpington Street site also houses the Department of Engineering workshops and the Dyson Design Centre which facilitate the manufacturing of products and components.

Further details can be found at: <https://www.dts.eng.cam.ac.uk/>.

### **3. The Fellowship programme**

#### **3.1. Programme aim**

FUTUREROADS is a 60-month programme that will offer 27 outstanding fellows 36-month fellowships linked to the programme's five thematic areas (all in the context of road networks):

- digital twins
- data science
- smart materials
- automation and robotics
- sustainability

The aim of FUTUREROADS is to recruit, train and support individual fellows who wish to contribute towards a sustainable future where advances in data and materials science enable the physical road infrastructure assets to be cognisant of their state and able to communicate it to their digital twin and robotic systems. This involves a transformational step change from assumption-based to information-rich modelling, manual to self-sensing health monitoring, and negative to positive social and environmental outcomes. To achieve this aim, the main objectives of the programme are:

- I. to recruit three diverse cohorts of best-in-class quality fellows;
- II. to provide induction and interdisciplinary training to ensure fellows have a good grasp of the fundamentals in all of FUTUREROADS thematic areas, as well as

- transferable skills training to ensure fellows have what it takes to excel both in their individual fellowships and future careers;
- III. to arrange for best-in-class supervisory teams for each fellow that closely align with the fellow's proposed project;
  - IV. to enable inter-sectoral and interdisciplinary research experiences for the fellows through short visits and secondments at partner organisations, as well as overseas universities and businesses with expertise in each fellow's project area;
  - V. to monitor ethics and MSCA compliance, progress and outcomes of all fellowships from recruitment to completion to ensure frequent and pro-active support and excellent dissemination and communication of the fellows' work.

### **3.2. Type and duration of the fellowship**

The FUTUREROADS programme will sponsor up to 27 fellowships over a period of 5 years. All fellowships are for experienced researchers, thereafter called fellows, who possess a PhD at the time of the application deadline. The duration of a fellowship is expected to be 36 months, but shorter periods (minimum 18 months) will be considered in extenuating circumstances based on what is suitable and realistic in relation to their fellowship application. The offered fellowships cannot be longer than 30<sup>th</sup> September 2026 due to finalization of the FUTUREROADS programme. All FUTUREROADS fellows will have their primary base at the Department of Engineering, UOC. However, they may have supervisors in other disciplines. Fellows also have the opportunity to pursue secondments.

The fellowship is designed to support post-doctoral researchers with up to 2 years of postdoctoral research experience (after completion of the PhD) at the time of applying. Applicants with 3-4 years of postdoctoral research experience will be considered in exceptional cases.

### **3.3. What is included**

The Fellowship covers the following:

- Salary – candidates will be offered a salary in line with the Marie Skłodowska-Curie COFUND Grant agreement
- Family allowance in line with the Marie Skłodowska-Curie COFUND Grant agreement will be provided to fellows who are either married or in a civil partnership on the start date of their fellowship as per UOC guidance. This may be revised later in their project if their family status changes.
- Expenses related to travel in line with the Marie Skłodowska-Curie COFUND Grant agreement
- Expenses for consumables, materials, small equipment, minor lab facility costs, and secondments; fellows who require additional research funds will have to make a separate case for it (see Appendix A of the project description & plan document to make a case)

There is also a training programme associated with the fellowship, detailed in Appendix A. Note that recruitments in MSCA COFUND programmes can be for a minimum duration of 3 months.

### 3.4. Process

Figure 1 outlines the selection process. Four different bodies will be involved in the evaluation and selection process:

1. The programme administration team (blue) responsible for administrative screening;
2. Three individual peer reviewers in remote evaluation (orange) responsible for phase 1 of technical screening;
3. The Selection Committee (purple) responsible for the interviews and phase 2 of technical and fellow screening;
4. The Quality Assurance group (green) responsible for independently overseeing the quality of the process and acting as the redress committee when needed;

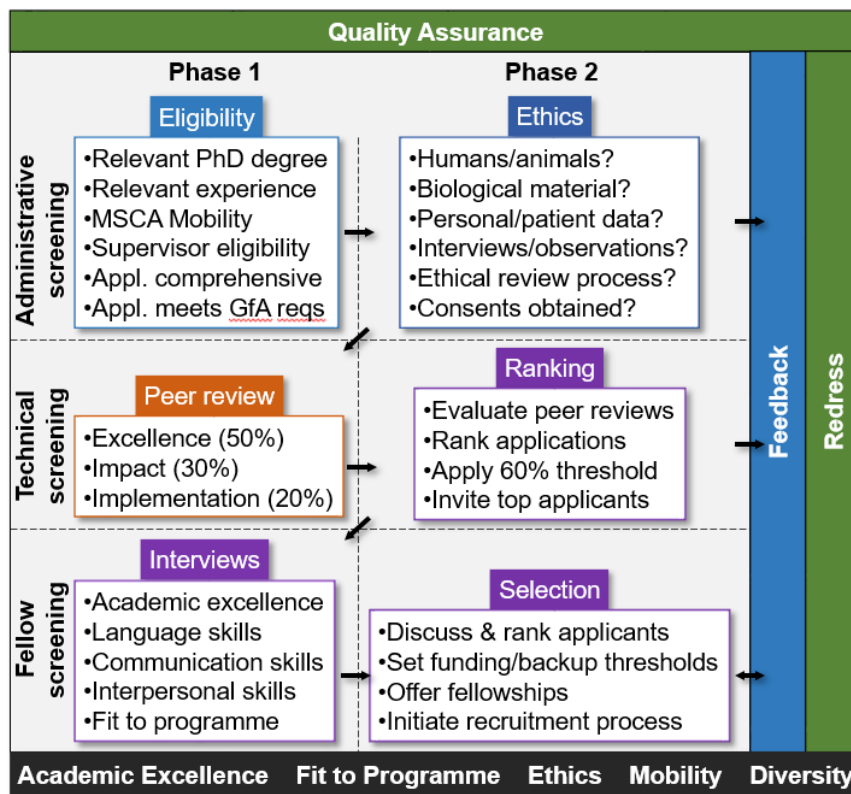


Figure 1 FUTUREROADS selection process

Shortlisted candidates will be invited to an interview. This will involve candidates giving a 20-minute prepared presentation, including a concise overview of their track record and their proposed topic. This will be followed by a 20-minute discussion with a fixed set of questions.

The final mark for each applicant who has reached the selection phase will be calculated by applying a 70% weight on their application score and a 30% weight on their interview score. This does not apply to applicants whose application scored below 60% or whose interview performance did not meet the selection committee's minimum expectations in any one area; in both cases, applicants will be removed from further consideration.

Unsuccessful applicants who wish to contest the outcome of the recruitment process will be asked to write a letter to the Quality Assurance group detailing the reasons for contesting the outcome. The letter and all relevant information will then be passed on to the Quality

Assurance group by the Programme Manager, and the group will be expected to convene within 10 working days to review the case. The group will discuss the applicant's claims and decide on their merits. If the rebuttal is successful, the applicant will be allowed to proceed further in the screening process with the Quality Assurance group acting on behalf of the selection committee or offered a fellowship if declined in the last phase and funding is available. If funding is not available, the Quality Assurance group will seek to fund the fellowship through additional funds from partners.

Note that for the Cohort 3 recruitment process, preferences will be allocated towards the successful candidates with project proposals in research themes: Automation & Robotics, Data Science, Sustainability and Smart Materials. Preferences are introduced to ensure the balance among number of Fellows working across FUTUREROADS Programme research themes.

### **3.5. Cohort start dates**

Each application round is associated with a specific cohort start date. Accepted applicants need to anticipate starting on these dates.

The FUTUREROADS programme commenced on 1 October 2021 and finish on 30 September 2026. It consists of 3 recruitment rounds:

- |          |   |
|----------|---|
| Round 1: | Recruitment from Dec 2021 – Jul 2022 (6 fellowships).<br>Fellowship duration: Sep 2022 – Aug 2025 - COMPLETED                       |
| Round 2: | Recruitment from month Jul 2022 – March 2022 (12 fellowships)<br>Fellowship duration: Jun 2023 – Jun 2026 – CLOSED FOR APPLICATIONS |
| Round 3: | Recruitment from month March 2023 - August 2023 (up to 11 fellowships)<br>Fellowship duration: Dec 2023 – Sep 2026                  |

The anticipated number of fellowships may change depending on overall application pool quality and availability of partner funding.

### **3.6. Additional information on MSCA COFUND Fellowships**

This document complements the general Information package for Marie Skłodowska-Curie fellows with information on the conditions of appointment and remuneration specifically for those holding an MSCA fellowship as part of a Co-funding of regional, national and international programmes (COFUND).

<https://marie-sklodowska-curie-actions.ec.europa.eu/document/information-note-for-msca-fellows-in-a-cofunding-of-regional-national-and-international-programme-cofund>

## **4. Who can apply and when**

### **4.1. Who can apply – eligibility**

Applicants must:

- have a PhD degree;

- have up to 2 years of postdoctoral research experience (after completion of the PhD) in any of the programme's relevant disciplines and areas of focus. Applicants with 3-4 years of postdoctoral research experience will be considered in exceptional cases
- be available to start their fellowship on their cohort start date;
- comply with the MSCA Mobility rule, i.e. applicants must not have resided or carried out their main activities (work, studies etc.) for more than 12 months in the UK in the three years immediately prior to the application deadline. The latter excludes time spent as part of a procedure for obtaining refugee status under the Geneva Convention, compulsory national service, and/or short stays such as holidays are not considered.

When reviewing applications, the reviewers and the Selection Team will account for the impact of career breaks impacting an individual's career path. This includes considerations such as maternity/paternity/parental/sick leave and military service.

## 4.2. When to apply

Application timeline for Cohort 3:

- Opening of call: 17th March 2023
- Deadline for applications: 23:59pm GMT 16th June 2023
- Evaluation period: app 8 weeks
- Applicants will receive answers: August 2023
- Fellowship period begins: December 2023

Dates in this section will be updated for future application rounds if applicable.

## 5. Your application – how to apply

This section provides an overview of the information that you will need to include in your application.

### Notice regarding authorship of applications

A principle of MCSA fellowships is that ideas for research come from the individual fellows. While we encourage prospective applicants to reach out to the relevant primary supervisors, named in section 5.2.3, to establish their interest in supervising their research, the primary supervisor will not be directly involved in authoring the proposal. However, the primary supervisor will need to endorse the application for it to proceed beyond administrative screening.

### 5.1. Overview

The application must be complete and comprehensive. It must contain all mandatory documents, and they must meet the requirements listed in this guide, including format, page/word limitations and necessary content. It must be authored by the applicant alone; any involvement from potential supervisors in co-authoring or reviewing the application will be grounds for disqualification. However, applicants should establish supervisor interest in their proposal. All applications will be screened and will be rejected if one or more conditions are not met. Wrong or missing information may cause an application to be ineligible. Applications

are expected to be based on “individual-driven mobility”, i.e. the applicants will be able to freely choose a research topic, the appropriate supervisor, and the secondment organisation(s) fitting their individual needs.

To start your application, you will be directed to the University's online portal for applying for a fellowship role. To submit an application for an advertised vacancy, please click on the link in the 'Apply online' section of the advert published on the University's Job Opportunities pages. This will route you to the University's Web Recruitment System, where you will need to register an account (if you have not already) and log in before completing the online application form. This will take you through a series of fields for providing personal data. You will then need to update a series of supporting documents. Please make sure that you upload all the required documentation for the FUTUREROADS fellowship, outlined below.

**Other personal data (on top of the entries required in the online portal):**

- Additional Applicant Information (via project description & plan document provided)
- Mobility statement (via project description & plan document provided)

**Proposed project information (via project description & plan document provided):**

- Research theme
- Primary academic discipline area
- Future Roads Challenge
- Project title
- Name of eligible primary supervisor
- Keywords
- Abstract
- Proposed international networking and industry secondments/short visits
- Optional experimental budget request
- Project description and plan details

**Declarations (via project description & plan document provided):**

- Mobility statement
- Supervisor contact
- Conflict of Interest declaration

**Referee Details**

- Names and contact details of two academics referees

**Supporting Documents:**

- Cover letter, CV and publication list (merged as one document)
- Project description & plan (via project description & plan document provided)
- Degree certificates (merged as one document)
- Ethics form

Please make sure you provide the required detail.

## 5.2. Completing proposed project information

### 5.2.1. Research theme

One of the five key programme areas needs to be selected as the area for the project. If your project covers more than one area, select the one as the primary area:

1. Automation & robotics
2. Data science
3. Digital twins
4. Smart materials
5. Sustainability

Note that for Cohort 3, research themes Automation & Robotics, Data Science and Sustainability are preferred themes. Among the candidates who successfully pass the selection process, the final ranking will be based on the assigning the priority to the projects addressing the challenges defined within preferred research themes.

### 5.2.2. Primary academic disciplines areas

FUTUREROADS is a highly interdisciplinary programme hosted by an equally interdisciplinary environment. In Table 2, you will find list of relevant academic disciplines.

FUTUREROADS Academic Disciplines		
	Academic Disciplines	Areas of focus
1	Civil Engineering	Transportation; Construction; Geotechnical; Environmental; Structural; Pavement, Surveying; Geodesy; Systems analysis
2	Earth Science	
3	Architecture	
4	Computer Science	Artificial Intelligence; Computer Vision; Data Structures; Computer Graphics; Cloud Computing; Scientific Computing; Data Management; Information Retrieval, Architecture & Management; Knowledge Management; Human-Computer Interaction; Parallel computing; Software Engineering; Robotics
5	Electrical Engineering	
6	Mechanical Engineering	
7	Chemistry	Nanotechnology; Electrochemistry; Polymers; Carbon Materials, Advanced Material Synthesis, Functional Materials, Cementitious Systems; Concrete Technology; Carbon Capture and Storage; Digital Materials; Green Chemistry; Biomimetic Materials; Waste Minimisation & Reuse; Material Flow; Circular Economy
8	Chemical Engineering	
9	Materials Science	
10	Mathematics	Geometry; Topology; Numerical Analysis; Statistics
11	Economics	Transport; Development; Financial; International; Labour; Macro; Micro; Public; Real Estate; Life cycle costing; Sustainability assessment
12	Business	Finance; Operations Management; Sustainability
13	Psychology	Traffic; Occupational
14	Sociology	Policy; Organisational; Behavioural
15	Law	Civil; Administrative; Labour; Property; Tax; Tort

Table 2 FUTUREROADS Academic Disciplines

### 5.2.3. FUTUREROADS challenge

Applicants should also indicate what FUTUREROADS challenge topic is the focus of their application. A list of challenges is provided here: <https://drf.eng.cam.ac.uk/research> (themes can be selected on the left hand side of the webpage to view the challenges under each theme). The industry partner associated with each challenge topic is provided on the website.

### 5.2.4. Project title

Please propose a project title to describe the research.

### 5.2.5. Name of eligible primary supervisor

You will need to name one of the following primary supervisors in your application:



1. Professor Ioannis Brilakis (Digital twins)
2. Dr Kristen MacAskill (Sustainability)
3. Dr Lavindra De Silva (Data science)
4. Professor Abir Al-Tabbaa (Smart materials)
5. Professor Fumiya Iida (Automation & robotics)

Every project requires a primary supervisor from the above named five. While the proposed research needs to be driven by applicants, they should be supported by a proposed supervisor before making an application. Supervisors can only formally endorse an application once it is completed and submitted on time. If the application falls short of the expected standard it may not be taken forward for further review.

Every fellow is expected to have 3-4 supervisors: one UOC primary supervisor with expertise in the core of the fellow's application, one UOC co-supervisor, one industry partner non-academic co-supervisor depending on the fellow's intersectoral secondment plans; and potentially one international academic or industrial co-supervisor for fellows whose application includes one or more international secondments or short visits. Applicants only need to identify a primary supervisor for the application. They may list more than one at this stage if pertinent to the project being proposed.

#### **5.2.6. Keywords**

Please list up to five key words to describe the proposal. These keywords will be used to help identify appropriate reviewers for the application.

#### **5.2.7. Abstract**

The abstract (max. 250 words) should provide a clear overview of the research, covering: the problem to be addressed, the objectives of the research, the relevance of these objectives and how these will be achieved.

The abstract will be used as a short summary of the proposal during the evaluation process, such as when communicating with potential reviewers. It needs to be clear, complete and not contain any information that is confidential. It must be written in plain text (no formulae).

#### **5.2.8. Proposed international networking and industry secondments/short visits**

Briefly describe here in 250 words your proposed wider collaboration arrangements (i.e. within the partner organisations and possibly beyond) necessary to advance your project and how these will support the success of the proposed project.

Applicants will be expected to include elements of cross-sectoral mobility and interdisciplinarity in their programmes such as international networking and intersectoral secondments and short visits. Proposed secondment options are expected to be included in applications. These only need to be proposed options, they do not need to be confirmed at the time of application.

International networking: We strongly recommend that applicants include suggested international secondments or short visits in their proposal. These should provide distinctive added value to the fellow's project above and beyond the value acquired through the

programme partners. They should not occur in the first year of the fellowship to give time to the fellow to develop their fellowship's foundations with the assistance of the beneficiary and the partners. Duration could range from a week for short visits to a maximum of three consecutive months for longer secondments. Secondments/visits should be at most six months in total over the total duration of the fellowship. Intersectorality: The unique partnership between UOC and industry partners in FUTUREROADS provides an excellent opportunity to all fellows to gain cross-sectoral experiences during their fellowship. All fellows will be expected to make a strong case in their applications on how substantial engagement with partners will make a positive impact on their research. Mobility, in the form of secondments at industry partner organisations, and how well integrated it will be in each fellowship application is a key criterion for selection. Specifically, we will seek to recruit candidates that can convincingly demonstrate how their cross-sectoral interactions enabled through FUTUREROADS will inform their research, such as (i) leveraging industry sector support to gain a deep understanding of the problems, the challenges and the end-user requirements necessary to help design solutions that fit the purpose; (ii) co-creation of technical and non-technical solutions with industry or with strong industry feedback to maximise the practical and commercial potential of the research; (iii) research validation using data, or material samples (or collected by the research through access to sites) provided by the non-academic sector; and/or (iv) conducting a joint exploitation study to evaluate the generated IP, study its commercial potential, and design a route to market.

#### **5.2.9. Optional additional budget request**

This section of the application should highlight any special budget considerations essential for the project (e.g. costs associated with special equipment) and outline plans for how the necessary costs will be met.

If your research is reliant on or will substantially benefit from an additional experimental or computational budget, please detail your request here. It is not guaranteed that these extra costs can be covered by the research programme, but you can make a case here. Please state any other possible sources of funding that you could apply for if your proposed costs cannot be covered by the Future Roads partners.

This section only needs to be completed if you anticipate a funding requirement beyond the standard funding offered to each fellow.

#### **5.2.10. Project description & plan**

The project description and plan needs to have a maximum of 2,500 words, including the list of references. The proposal may include a maximum of three figures, images or tables that are not included in the word count. In addition to this allowance, we ask that applicants include a Gantt chart with this document.

Applications must have a detailed project description since the reviewers cannot evaluate poorly defined proposals adequately. See section 7 for the assessment criteria.

This is your opportunity to clearly communicate the proposed research project. The proposed project must be sufficient enough to justify a 3-year fellowship. It should:

- Describe current state of the art in the field
- Clearly state the aims, objectives and deliverables of the project
- Set out the case for how the project will contribute to knowledge

- Outline proposed research methods and describe the appropriateness of these methods. This includes a description of any data requirements
- Propose co-supervisors, or provide a description of expertise needed from co-supervision arrangements

In considering principles of responsible research, we encourage participants to consider the following questions in a responsible research section in their proposal:

- Why should this research be undertaken?
- Will the outcome of the research be socially desirable?
- What are the potential uses and consequences?
- Are there any controversial aspects of the research?
- Who are the key stakeholders?

#### **5.2.11. Declarations**

Please tick the boxes to confirm your mobility statement, supervisor endorsement and make a conflict of interest declaration.

Conflict of interest can be defined as a situation where the impartial and objective evaluation by the Selection Committee (listed here: [Who We Are | DRF \(cam.ac.uk\)](http://www.cam.ac.uk/who-we-are/dr-fellowship)) is compromised for reasons involving economic interest, political or national affinity, family or emotional ties.

In practice, applicants who find themselves in one or more of the following situations should immediately inform the Supervisory Board.

At least one member of the Selection Committee:

- was involved in the preparation of the proposal
- has carried out research collaborations or co-published papers with the applicant
- is intending to co-supervise the research of the applicant
- stands to benefit directly should the proposal be accepted
- has a close family or personal relationship with the applicant
- is a director, trustee or partner or is in any way involved in the management of an applicant
- is acting as a referee of an applicant

A declaration will not impact the assessment of an applicant's proposal but will ensure that this conflict can be appropriately managed in the review process.

#### **5.2.12. Referee details**

Candidates are asked to provide contact details of two academic referees in the job application portal. Please indicate that you are happy for the referees to be contacted prior to the final interview stage. This will help facilitate the selection process following the outlined timeline.

### **5.3. Supporting documents**

#### **5.3.1. Cover letter, CV, degree certificates and publication list**

Cover letter

This is your opportunity to introduce yourself and outline your motivation for applying for participating in FUTUREROADS. Provide a brief outline of your motivation to participate in this programme, how you will benefit from the programme and how you think you can add value to the programme (this could be both socially and academically). Please demonstrate evidence that you have considered the characteristics of the programme.

## CV

The CV should be a maximum of 2 pages (not including publication list). It should list your education, career and other relevant achievements. If the applicant CV is longer than 2 pages the application will be rejected.

## Publication List

The publication list should be a maximum of 2 pages. It is expected that this is more than sufficient for the target career level of FUTUREROADS, this is a maximum limit only, not an expectation. Provide full details for each publication as if citing for a peer reviewed journal. Include a DOI reference where applicable. If the list is longer than 2 pages the application will be rejected.

### **5.3.2. Degree certificates**

A copy of your PhD certificate needs to be included with your application as an attached file. If the certificate is not in English, a translated copy must also be provided. If you have completed the requirements for your PhD but have not yet been awarded a certificate, you may provide alternative supporting written evidence from your awarding institution.

### **5.3.3. Ethics**

All applicants will need to complete an ethics form (accessible via the programme website and attached as Appendix C of this document), even if there are no ethics considerations to declare. The general principles and requirements of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers applies.

## **6. General submission requirements**

Applications must be written in English. Written documentation associated with the submission must be in 11 pt font with at least 2 cm margins. 1.5 line spacing is preferred for the abstract, project description and plan and cover letter. This line spacing requirement does not need to be applied strictly to the CV and publication list.

## **7. Assessment criteria**

The criteria have been adapted from the MSCA-IF evaluation criteria. The primary assessment criteria are scientific excellence of the research project, impact of the project, and quality of the applicant. The most important goal of the evaluation process is to select the most talented and most promising fellows possible, and to provide them with the best research environment, training, and career development opportunities. The three main criteria and corresponding sub-criteria (described in each column) are outlined in the table below.

Excellence (50% / 1)*	Impact (30% / 2)*	Quality of Applicant (20% / 3)*
Scientific merits of the proposed research: clear, convincing and compelling; Thoroughness: definition of the problem, review of state of the art, and proposed solutions; Novelty and originality; Feasibility: scientific, technological, fit to available infrastructure, project timeline, research design and deliverables, associated risks; Appropriateness of additional resources (if requested); Ethical issues: compliance with UOC ethical practices when dealing with safety and security, use of animals and human subjects, environment, embargos and sanctions.	Problem significance; Expected academic contributions; Expected contribution to practice and the society at large; enhancing the potential and future career prospects of the applicant; Aligning practices with the principles and priorities of the partner organisations in research and innovation; Quality of the proposed measures to exploit and disseminate the results; Quality of the proposed measures to communicate the results to different target audiences.	Academic qualifications and achievements in relation to their stage of career; Demonstrated relevant research experience; level of independence; and Publication track record. Applicants who have taken career breaks, such as due to e.g. maternity, paternity or parental leave, compulsory military service or intersectoral mobility where the time for research has been limited, will not be adversely impacted as long as they have disclosed them in their application.
*weighting applied to criteria / priority applied in case of ex aequo		

Table 3 Selection criteria

## 8. Selection timeline

The timeline is as per Figure 2.

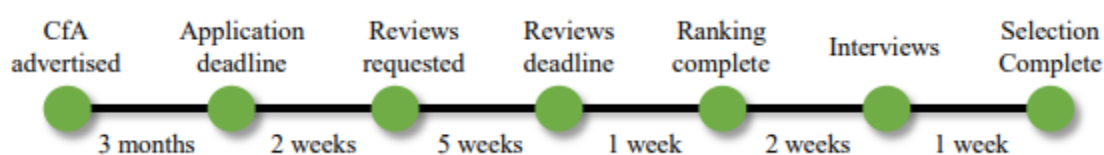


Figure 2 Selection timeline

## 9. Working in Cambridge

### 9.1. Employment and benefits

Applicants will be recruited in accordance with The European Charter for Researchers and The Code of Conduct for the Recruitment of Researchers.

The University offers employees a wide range of competitive benefits (including discretionary benefits) from healthcare cash plans to childcare, a cycle to work scheme to shopping and

insurance discounts. There is something for everyone. Further details can be found here: <https://www.hr.admin.cam.ac.uk/pay-benefits/cambens-employee-benefits>.

One of our core values at the UOC is to recognise and reward our staff as our greatest asset. We realise that it's our people who have built our outstanding reputation and that we will only maintain our leading position in the academic world by continuing to attract and retain talented and motivated people. If you choose to come and work with us, you will find that we offer:

- Excellent benefits
- A welcoming and inclusive environment
- Extensive development opportunities

The salary of offer relates to the Marie Skłodowska-Curie COFUND grant.

The UOC endeavours to help staff balance home and work life by providing generous annual leave entitlement and procedures for requesting a career break or flexible working arrangements if they are needed. Further details can be found here: <https://www.hr.admin.cam.ac.uk/hr-staff/information-staff/staff-guide/terms-employment/hours-work>

The UOC is committed to providing a safe and healthy working environment for its staff and recognises the importance of fostering psychological as well as physical well-being. For more information on our Wellbeing at Work policy please visit: <https://www.hr.admin.cam.ac.uk/policies-procedures/managing-stress-and-promoting-wellbeing-work-policy/policy-statement>. This commitment arises from the University's duty of care to all its staff, and more generally the recognition that a safe and healthy working environment contributes to the motivation, job satisfaction, performance, and creativity of all staff.

#### **9.1.1. Equality of Opportunity at the University**

We are committed to a proactive approach to equality, which includes supporting and encouraging all under-represented groups, promoting an inclusive culture and valuing diversity. We make selection decisions based on personal merit and an objective assessment against the criteria required for the post. We do not treat job applicants or members of staff less favourably than one another on the grounds of sex (including gender reassignment), marital or parental status, race, ethnic or national origin, colour, disability (including HIV status), sexual orientation, religion, age or socio-economic factors.

We have various diversity networks to help us progress equality; these include the Women's Staff Network, the Disabled Staff Network, the Black and Minority Ethnic Staff Network and the Lesbian, Gay, Bisexual and Transgender Staff Network. In addition, we were ranked in the top 100 employers for lesbian, gay and bisexual (LGB) staff in Stonewall's Workplace Equality Index 2013 and we hold an Athena SWAN silver award at organisation level for promoting women in Science, Technology, Engineering and Medicine.

The Department is committed to promoting gender equality as part of a landscape of encouraging diversity, tolerance and a culture of mutual support. The dedicated Diversity Committee oversees equality, diversity and inclusion related activities in the Department, and holds regular events to promote Engineering to under-represented groups. The Department was first granted an Athena SWAN Silver Award in 2017, which was renewed in September

2020 to recognise the Department's ongoing commitment to advancing the careers of women in STEMM. The Department of Engineering continues to make excellent progress towards achieving gender balance amongst its staff and students. More information on the Athena SWAN Charter can be found [here](#).

### **9.1.2. Information if you have a Disability**

The University welcomes applications from individuals with disabilities and we are committed to ensuring fair treatment throughout the recruitment process. We will make adjustments to enable applicants to compete to the best of their ability wherever it is reasonable to do so, and, if successful, to assist them during their employment. Information for disabled applicants is available at <http://www.admin.cam.ac.uk/offices/hr/staff/disabled/>.

We encourage you to declare any disability that you may have, and any reasonable adjustments that you may require, in the section provided for this purpose in the application form. This will enable us to accommodate your needs throughout the process as required. However, applicants and employees may declare a disability at any time.

If you prefer to discuss any special arrangements connected with a disability, please contact the Future Roads Programme Managers who are responsible for recruitment to this position by email on [DRF-initiative@eng.cam.ac.uk](mailto:DRF-initiative@eng.cam.ac.uk). Alternatively, you may contact the HR Business Manager responsible for the department you are applying to via [hrenquiries@admin.cam.ac.uk](mailto:hrenquiries@admin.cam.ac.uk).

## **9.2. Life at Cambridge**

UoC has a large post-doctoral research community. The Postdocs of Cambridge Society provides helpful resources which are especially helpful for anyone who is new to Cambridge: <https://www.pdoc.cam.ac.uk/>. The FUTUREROADS programme will provide fellows with an opportunity to pursue curiosity-driven research in the theme of “future roads”.

The programme has a base in the new (2019) Civil Engineering building at the UOC, pictured on the front page of this document, providing space for fellows them to network and collaborate with each other regardless of which department their supervisors work for. The Civil Engineering building has a spacious kitchen area with plenty of seating for lunch breaks and a terrace for sitting outside in nice weather. The building has disability access.

There are several cafes and a canteen nearby, a local shop (Sainsbury) is also just a short walk away. From the city centre it only takes about 10 minutes of cycling to West Cambridge. There is also a bus stop near to the building. In terms of accommodation there are university accommodations available in walking distance (subject to availability).

## **9.3. Assistance**

This document is designed to help guide applicants through the application process. Please refer to the next section for further information about assistance available.

For practical and logistical matters that may occur from pre-arrival to post-departure, fellows will be provided with HR support via the UOC Department of Engineering's Research Office. Their primary supervisor will also act as a first point of call for advice.

#### **9.4. Further information**

If you cannot find answers to your questions in this document, the programme website, or the FAQs, you can direct your queries to the Future Roads Programme Manager at: [DRF-initiative@eng.cam.ac.uk](mailto:DRF-initiative@eng.cam.ac.uk).

Please refer to the Future Roads website for general information about the programme: <https://drf.eng.cam.ac.uk>

The FUTUREROADS programme has received funding from the European Union's Horizon 2020 Research and Innovation Programme under the Marie Skłodowska-Curie grant agreement No 101034337. For further information about the Marie Skłodowska-Curie actions, please visit: [Marie Skłodowska-Curie actions | Horizon 2020 \(europa.eu\)](#)

The University of Cambridge is committed in its pursuit of academic excellence to equality of opportunity and to a pro-active and inclusive approach to equality, which supports and encourages all under-represented groups, promotes an inclusive culture, and values diversity. For more information please visit [Equal Opportunities Policy | Equality & Diversity \(cam.ac.uk\)](#).



## Appendix A –Training programme details

Cohort-based, cross-disciplinary training is a central element to the education and research of the Future Roads Fellowship. An extensive training programme on both research skills and non-research oriented transferable skills has been designed for the fellows.

There will be a two-week period of induction activities for each cohort to welcome the fellows to Cambridge; to the research environment; the partners; and the previous cohorts (where relevant). The induction period will also introduce the fellows to the high-level context of FUTUREROADS. The training will be co-delivered by senior personnel in the Department's Research Office, HR Office, Post-doctoral Committee, current fellows, the PIT and several academic colleagues and industry professionals. The event will also initiate a series of cohort building activities to develop the cohort cohesion and identity right from the start. This will also form the start of the transferrable skills programme.

The main objectives of the training on research skills with the appropriate disciplines is to introduce all the fellows to the relevant high-level cross-disciplinary and cross-sectoral context and research challenges as well as those specific to each of the five research theme areas. Most fellows will have completed PhDs in one of the relevant disciplines. The proposed programme will provide them with research training in the other research themes within the programme and relevant cross-disciplinary research to ensure that all fellows have the same basic understanding of all main areas. Training in wider research skills will also be provided through the fellows' engagement in aligned and complementary programmes and engagement with the wider research community, including other postdocs and PhD students.

The interfaces between the five interlinked research themes of the programme are likely to form highly novel research aspects of the fellow's projects. This is why the FUTUREROADS training aims to bring all fellows to the same level of understanding of its main scientific areas: All fellows will attend five 2-day technical training programmes on research skills, one for each of the five theme areas, as detailed above. Each training event will include one day on fundamentals and principles followed by one day hands-on activities and demonstrations.

Table A1: Technical training programme

Training in Digital Twins:	
Day 1	Introduction to information modelling and the concept of Digital Twins as a product and process: Data structures, Cloud architectures; generating and updating Digital Twins; cybersecurity; distributed ledger systems; standards and policy; interoperability; applications in manufacturing and the built environment; costings and sustainability.
Day 2	Hands-on activity: Making a Digital Twin; collecting raw geometry data, generating an object-oriented geometry only twin, adding non-geometric data, and linking to a time-series sensor database.

Training in Advanced Materials
--------------------------------

Day 1	Introduction to advanced materials for construction and road infrastructure: Classifications, testing, performance, monitoring and modelling; Scaling up commercialisation, codes, and Standards; costings and sustainability.
Day 2	Hands-on activities and demonstrations: Advanced materials synthesis, characterisation and microstructural analyses, element and large-scale testing, accelerated ageing, centrifuge testing, data analysis, commercial applications.

#### **Training in Automation and Robotics:**

Day 1	Introduction to robotics and autonomous systems, Foundations of robotics, inverse-kinematic control, dynamic robot control, planning algorithms, sensing and state estimation techniques, learning, optimisation, and adaptation
Day 2	Tutorials and hands-on-session: Modelling and simulation of autonomous robotic arms, controller designs, computational optimisation techniques, experimentation of robotic construction and sensing

#### **Training in Data Science:**

Day 1	Fundamentals of machine learning; Foundational mathematical tools; Algorithms for data; Physical phenomena and their sensors; Uncertainty in physical measurements and data; Uncertainty propagation; Sensor data fusion; Practical tools for machine learning from sensor data; Embedded & <i>in situ</i> machine learning at the edge of the network & TinyML; Cloud-based tools for large datasets.
Day 2	Hands-on activities and demonstrations: Processing large pre-existing sensor datasets; Deploying sensors and data acquisition; Programming embedded sensor systems; Deploying cloud-based data analysis; Deploying <i>in situ</i> data analysis using TinyML

#### **Training in Sustainable Development:**

Day 1	Introduction to sustainable development policy and applications to engineering systems: Current international policy overview and impacts on national/local infrastructure planning; sustainability versus resilience principles; decision trade-offs; example sustainability assessment tools.
Day 2	Hands-on activity: Applied case study of sustainability assessment.

Wider training for all the fellows will be facilitated through many existing aligned programmes at UOC and its collaborators. Additional specific training for individual fellows will be through secondments to international centres of excellence as well as to the industry partners.

Specific training directly required by the fellows for their research project can also be provided by the supervisory team. All academic supervisors have their own research groups and research facilities. They will provide their fellows with group and project specific training as required.

Given the large size of the post-doc fellow community within Cambridge, there is a well-established and extensive programme of additional training specifically tailored for fellows' needs and requirements. An annual programme of personal and professional, commercial, and transferable skills training is available with an online booking system. An extensive training programme can be tailored by fellows, in agreement with their supervisor.

The programme will include a large number of diverse workshops, training sessions and courses, which the fellows will use to design their own programme of skills development, depending on their priority development needs and other commitments. As a minimum each ER will receive training in the following: (i) Grant writing; (ii) Project management, (iii) IPR management; (iv) Entrepreneurship skills; (v) Training for job interviews; (vi) CV writing; (vii) Open science skills; (ix) Public engagement & communication skills; (x) Gender and (xi) Citizen science skills.

## Appendix B – project description & plan template

Please note that this Appendix is just a copy of the project description & plan template. Applicants should download the editable version directly from the website ([Application Process | Digital Roads of the Future \(cam.ac.uk\)](https://cam.ac.uk)).

### **FUTUREROADS-COFUND Marie Skłodowska-Curie Fellowships - Cohort 3 (Fellowship duration: October 2023 – September 2026)**

In addition to the information that applicants will need to provide on the online portal, applicants are required to fill out the sections below. Please ensure that you fill out each section accordingly.

#### **1. Applicant Information:**

Full name (Last, First, Middle):	Please fill out.			
Year of PhD completion:	Please fill out.			
Years of postdoctoral research experience:	Please fill out.			
Career break record:	From (MM/YY):	Please fill out.	To (MM/YY):	Please fill out.
	From (MM/YY):	Please fill out.	To (MM/YY):	Please fill out.
Reasons for applying to FUTUREROADS (max. 100 words):	Please fill out.			

#### **2. MSCA Mobility Statement:**

Please indicate the period(s) and the country/countries in which you have legally resided and/or had your main activity (work, studies etc.) during the last three years up until the application deadline. Wrong or missing information may cause your proposal to be ineligible. Any additional information you wish to make known to the evaluators should be included in the CV.

Country of residence:	Period (MM/YY - MM/YY):	Main activity:
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.

Please fill out.	Please fill out.	Please fill out.
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\*Please ensure that Part 3 starts on a new page\*

### 3. Proposed Project Information:

Research theme: (You may also identify a secondary theme if your proposal is cross-cutting)	Please fill out.
Primary academic discipline area:	Please fill out.
Future Roads challenge addressed:	Please fill out.
Project title:	Please fill out.
Name of the eligible supervisor:	Choose an item.
Keywords (max. 5 words):	Please fill out.
Abstract (max. 250 words):	Please fill out.
Proposed international networking and industry secondments/short visits (max. 250 words):	Please fill out.
Optional additional budget request:	Please fill out Appendix A for any additional budget request.

### 4. Project description & plan:

The project description and plan needs to have a maximum of 2,500 words, including the list of references. The proposal may include a maximum of three figures, images or tables that are not included in the word count. In addition to this allowance, we ask that applicants include a Gantt chart with this document.

This is your opportunity to clearly communicate the proposed research project. The proposed project must be sufficient enough to justify a 3-year fellowship. It should:

- Describe current state of the art in the field
- Clearly state the aims, objectives and deliverables of the project
- Set out the case for how the project will contribute to knowledge
- Outline proposed research methods and describe the appropriateness of these methods. This includes a description of any data requirements
- Propose co-supervisors, or provide a description of expertise needed from co-supervision arrangements

In considering principles of responsible research, we encourage participants to consider the following questions in a responsible research section in their proposal:

- Why should this research be undertaken?
- Will the outcome of the research be socially desirable?
- What are the potential uses and consequences?

- Are there any controversial aspects of the research?
- Who are the key stakeholders?

Please fill out.

Please ensure that a proposed project Gantt chart is included in this section.

## 5. Declarations:

<input type="checkbox"/>	Mobility statement: By ticking this box the applicant confirms that they have not resided or carried out their main activity (work/studies etc.) in the UK for more than 12 months in the three years immediately before the call deadline.
<input type="checkbox"/>	Supervisor support: By ticking this box the applicant confirms that the proposed supervisor has indicated initial support of their intention to submit an application (see section 5.2.5 of the Guide for Applicants).
<input type="checkbox"/>	Conflict of Interest: By ticking this box the applicant confirms that they have not collaborated or published with any member of the Selection Committee and are not intending for this project to be co-supervised by any member of the Selection Committee (see section 5.2.11 of the Guide for Applicants).

## 6. Referee details

Academic referee 1: <i>name, email address (and phone number if possible)</i>	
Academic referee 2: <i>name, email address (and phone number if possible)</i>	

## 7. Guidance:

Please ensure that you are uploading the following supporting documents to the Online Portal in addition to this template document:

1. Cover letter, CV, publication list (merged as **one** document)
2. Project description & plan (this document)
3. Degree certificates (merged as **one** document)
4. Ethics form

You can find additional information on the Guide of Applicants and FAQ which are provided on the programme website.

Please refer to the Future Roads website for general information about the programme:  
<https://drf.eng.cam.ac.uk>.

If you cannot find answers to your questions in these documents or the programme website, you can direct your queries to the Future Roads Programme Manager at: [DRF-initiative@eng.cam.ac.uk](mailto:DRF-initiative@eng.cam.ac.uk).

#### **Appendix A: Optional additional budget request**

<b>Item:</b>	<b>Cost in GBP:</b>	<b>Justification:</b>
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.
Please fill out.	Please fill out.	Please fill out.



## Appendix C – Ethics Form

Please note that this Appendix is just a copy of the project description & plan template. Applicants should download the editable version directly from the website ([Application Process | Digital Roads of the Future \(cam.ac.uk\)](#)).

### ETHICS FORM

Every applicant will be required to complete an initial ethics review (a self-assessment checklist) as part of the application process. The questions in this form are based on the Horizon 2020 Programme Guidance for completion of ethics self-assessment, covering key areas of:

- (1) Human embryos and fetuses
- (2) Human beings
- (3) Human cells or tissues
- (4) Personal data
- (5) Animals
- (6) Non-EU countries
- (7) Environment, health & safety
- (8) Dual use
- (9) Exclusive focus on civil applications
- (10) Potential misuse of research results and
- (11) Other ethics issues

while respecting that the scope of the research is not yet known.

It is expected that no research under this programme will require detailed ethics considerations for items (1), (3) or (5), but these will remain included in the checklist for applicants to make a full declaration. The answer to questions should be “no” for section 1, 3 & 5 for valid proposals.

**Please respond to every question below.**

	yes	no
<b>Section 1: HUMAN EMBRYOS/ FOETUSES</b>		
1. Does your research involve Human Embryonic Stem Cells (hESCs)? <i>Must be “no” for valid proposals.</i>	<input type="checkbox"/>	<input type="checkbox"/>
	yes	no
<b>Section 2: HUMANS</b>		
1. Does your research involve human participants? <i>If yes, please answer the following questions.</i>	<input type="checkbox"/>	<input type="checkbox"/>

a. Are they volunteers for social or human sciences research?	<input type="checkbox"/>	<input type="checkbox"/>
b. Are they persons unable to give informed consent (including children/minors)?	<input type="checkbox"/>	<input type="checkbox"/>
c. Are they vulnerable individuals or groups?	<input type="checkbox"/>	<input type="checkbox"/>
d. Are they children/minors?	<input type="checkbox"/>	<input type="checkbox"/>
e. Are they patients?	<input type="checkbox"/>	<input type="checkbox"/>
f. Are they healthy volunteers for medical studies?	<input type="checkbox"/>	<input type="checkbox"/>
2. Does your research involve physical interventions on the study participants? <i>If yes, please answer the following questions.</i>	<input type="checkbox"/>	<input type="checkbox"/>
a. Does it involve invasive techniques (e.g. collection of human cells or tissues, surgical or medical interventions, invasive studies on the brain, TMS etc.)?	<input type="checkbox"/>	<input type="checkbox"/>
b. Does it involve collection of biological samples?	<input type="checkbox"/>	<input type="checkbox"/>

yes                  no

### Section 3: HUMAN CELLS / TISSUES

1. Does your research involve human cells or tissues (other than from Human Embryos/Foetuses, see section 1)? <i>Must be "no" for valid proposals.</i>	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

yes                  no

### Section 4: PROTECTION OF PERSONAL DATA

1. Does your research involve processing of personal data? <i>If yes, please answer the following questions.</i>	<input type="checkbox"/>	<input type="checkbox"/>
a. Does it involve the processing of special categories of personal data (e.g. genetic, health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction.)?	<input type="checkbox"/>	<input type="checkbox"/>
b. Does it involve processing of genetic, biometric or health data?	<input type="checkbox"/>	<input type="checkbox"/>
c. Does it involve profiling, systematic monitoring of individuals or processing of large scale of special categories of data, intrusive methods of data processing (such as, tracking, surveillance, audio and video recording, geolocation tracking etc.) or any other data processing operation that may result in high risk to the rights and freedoms of the research participants?	<input type="checkbox"/>	<input type="checkbox"/>
2. Does your research involve further processing of previously collected personal data (including use of pre-existing data sets or sources, merging existing data sets)?	<input type="checkbox"/>	<input type="checkbox"/>

3. Does your research involve publicly available data?	<input type="checkbox"/>	<input type="checkbox"/>
4. Is it planned to export personal data from the EU to non-EU countries?  Specify the type of personal data and countries involved: <small>Click or tap here to enter text.</small>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is it planned to import personal data from non-EU countries into the EU?  Specify the type of personal data and countries involved <small>Click or tap here to enter text.</small>	<input type="checkbox"/>	<input type="checkbox"/>

yes                  no

### Section 5: ANIMALS

1. Does your research involve animals? <i>Must be "no" for valid proposals.</i>	<input type="checkbox"/>	<input type="checkbox"/>
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yes                  no

### Section 6: THIRD COUNTRIES

1. In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?  Specify the countries involved: <small>Click or tap here to enter text.</small>	n/a	n/a
2. Is it planned to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
3. Is it planned to import any material from non-EU countries into the EU? For data imports, see section 4. For imports of human cells or tissues, see section 3.  If yes, specify the materials and countries involved: <small>Click or tap here to enter text.</small>	<input type="checkbox"/>	<input type="checkbox"/>

4. Is it planned to export any material from the EU to non-EU countries? For data exports, see section 4.  If yes, specify the material and countries involved:  Click or tap here to enter text.	<input type="checkbox"/>	<input type="checkbox"/>
5. In case research involves low and/or lower-middle income countries, are any benefit sharing actions planned?	<input type="checkbox"/>	<input type="checkbox"/>
6. Could the situation in the country put the individuals taking part in the research at risk?	<input type="checkbox"/>	<input type="checkbox"/>
	yes	no

### Section 7: ENVIRONMENT & HEALTH AND SAFETY

1. Does your research involve the use of elements that may cause harm to the environment, to animals or plants? For research involving animal experiments, see section 5.	<input type="checkbox"/>	<input type="checkbox"/>
2. Does your research deal with endangered fauna and/or flora /protected areas?	<input type="checkbox"/>	<input type="checkbox"/>
3. Does your research involve the use of elements that may cause harm to humans, including research staff? For research involving human participants, see section 2.	<input type="checkbox"/>	<input type="checkbox"/>
	yes	no

### Section 8: DUAL USE

1. Does this research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required	<input type="checkbox"/>	<input type="checkbox"/>
	yes	no

### Section 9: EXCLUSIVE FOCUS ON CIVIL APPLICATIONS

1. Could your research raise concerns regarding the exclusive focus on civil applications?	<input type="checkbox"/>	<input type="checkbox"/>
	yes	no

### Section 10: MISUSE

1. Does your research have a potential for misuse of research results?	<input type="checkbox"/>	<input type="checkbox"/>
	yes	no

## Section 11: OTHER ETHICS ISSUES

1. Are there any other ethics issues that should be taken into consideration?

☐☐

If yes, please specify:

Click or tap here to enter text.