

TERMS AND CONDITIONS AND REGULATORY CALL FOR THE URBAN CHALLENGE FOR THE APPLICATION OF THE ARTIFICIAL INTELLIGENCE IN TRAFFIC LIGHT REGULATION

1. PURPOSE

1.1. The purpose of these rules is to regulate the procedure for granting the financial contribution to the urban challenge for the application of artificial intelligence to traffic light regulation, on a competitive basis and in accordance with the Collaboration Agreement formalised between Barcelona City Council, the Barcelona International Fair (hereinafter, Fira de Barcelona) and the *Barcelona Institute of Technology for the Habitat* Foundation (hereinafter, BIT Habitat) for the promotion of the **BARCELONA INNOVA LAB MOBILITY**.

- (i) **Barcelona City Council** leads innovative initiatives to improve mobility in the city and has positioned the city as a benchmark *pool* for innovation in Europe. With a clear focus on innovation, it implements technological solutions to optimize public transport and promote sustainability. Through research and development, the city seeks to create an efficient and modern mobility system adapted to current challenges.
- (ii) **BIT HABITAT** is the municipal entity in charge of deploying Barcelona City Council's innovation strategy. Its mission is to support municipal areas or bodies in the deployment of innovation instruments that, through collaboration with companies, universities, research centres or associations, make Barcelona a more sustainable, inclusive and efficient city. As part of its work plan, it deploys the Urban Challenges program, to solve municipal needs that do not find an existing solution in the market and coordinates the deployment of the ordinance to facilitate the creation of a regulated test environment (sandbox). It manages the Urban Innovation Centre, Ca l'Alíer.
- (iii) **Fira de Barcelona** promotes the **TOMORROW MOBILITY** Show, which within the scope of SMART CITY, is intended to publicise the most important advances worldwide in the field of sustainable mobility, acting as a strategic lever to publicise and scale up initiatives in this field internationally, and in addition to making available to the different actors of sustainable mobility a permanent physical space for innovation open to companies of the sector.

1.2. The purpose of the **BARCELONA INNOVA LAB MOBILITY** is to promote innovation and the transfer of knowledge between the parties that make it up, through the mechanisms identified in the Collaboration Agreement, and through the development of initiatives including the "**Urban Challenges**", understood as a way of approaching the resolution of complex and specific problems and needs that require innovative solutions and that call for the innovative ecosystem to contribute its proposals without limitation in forms and without demanding specific solutions.

1.3. Urban challenges are an invitation to creativity that, in turn, seek to strengthen business ecosystems using innovation and knowledge transfer as a lever, being a necessary strategic element to strengthen the economy, generate quality employment and attract and retain talent. This impulse must have a clear vocation of permanence, developing in a sustained way over time so that companies and entities that work on innovation establish themselves and consolidate their presence in the city of Barcelona.

2. BACKGROUND

2.1. The city of Barcelona is evolving towards a model of sustainable, local and healthy mobility, at the service of people. Although the city has a wide range of public and private transport, it still faces the structural challenges arising from one of the highest population densities in Europe. Historically, the use of combustion and low-occupancy vehicles has generated congestion problems and has had a negative impact on global warming, air quality and noise levels.

To mitigate these externalities, the city has been promoting mass transport (metro, bus and tram) and active mobility (on foot and by bicycle) for years, as well as implementing measures such as the Low Emission Zone (LEZ). Thanks to this strategy, Barcelona has a multimodal and segregated network that has achieved a balanced modal distribution in 2023: 45.9% in active mobility, 34.2% in public transport and only 19.9% in private vehicles. Despite these advances, the urban fabric, especially the mesh network of streets in the Eixample, generates numerous intersections regulated by traffic lights. These become critical points where challenges of coexistence are posed and what should be the priority of passage for the affected modes.

Currently, traffic regulation in urban areas is traditionally managed with conventional traffic light control systems. These systems were designed in the twentieth century with the aim of facilitating the circulation and safety of motor vehicles. The new mobility objectives, where mass transport and active modes are becoming more important, force us to rethink whether these systems are suitable for the future of mobility in Barcelona.

New sensorisation technologies, artificial vision, connected vehicles, high-speed and low-latency communication networks, the development of neural computing networks and the advent of artificial intelligence, point to the possibility of achieving a new generation of traffic light control systems that respond to the objective of improving people's mobility. of all users of public roads, optimizing mass transport flows, traffic, and pedestrians, as well as reducing polluting emissions, improving the prioritization of public transport and increasing road safety.

This planning takes into account the urban particularities of Barcelona and the coexistence between the different modes of transport – pedestrians, bicycles, public transport and motor vehicles – and their users. The high multimodality, where vehicles with very different speeds, sizes and vulnerabilities coexist, is added to a mesh network structure with regular islands and frequent intersections. Likewise, it should be considered that the flow of journeys is greater in the horizontal axes (Llobregat-Besòs) than in the vertical axes (Mar-Muntanya); determining factors for designing a new traffic light regulation that responds to the reality of the city.

Barcelona currently has 1,818 traffic light crossings. More than 90% of the intersections operate with static plans and time selection, with predefined phase changes that do not respond dynamically to incidents, variations in demand or exceptional situations. However, the city already has a solid basis for change: 60% of the traffic light network is equipped with regulator technology and fibre optic communications, enough to allow dynamic and centralised regulation from the Control Centre. This ensures the latencies necessary for intelligent mobility management, adapted to the changing conditions of mobility flows.

The system integrates basic traffic data (Intensity and Occupancy) from different types of detectors such as spirals, infrared or artificial vision cameras, which are added via traffic light regulator to be integrated into the system.

Thus, the system has a lot of room for improvement in terms of flexibility and integration of new data sources (cameras, sensors, connected vehicle, etc.), to evolve towards traffic light control based on artificial intelligence, which is more efficient, flexible and aligned with the real needs of urban mobility.

For more details on the current traffic regulator of Barcelona, Annex VI contains the technical and functional specifications of the current traffic regulator and Annex VII contains the communication protocol of the traffic regulator of Barcelona. Both annexes have their original version in Spanish.

2.2. The city of Barcelona is and wants to be a pioneer in the adoption of new solutions and technologies that improve the lives of the people who live there, but not at any cost.

2.3. Technology, by its very nature, evolves much faster than the ability to create the right regulatory framework to facilitate government adoption, and the conditions for consequent innovation to have a positive impact on people's quality of life.

2.4. Administrations, in this sense, have the responsibility to foresee and anticipate changes, to ensure that technological innovations are of public interest, benefit all citizens and follow ethical standards, both in their development and use.

2.5. On the one hand, therefore, administrations must be able to adopt and adapt technological innovations so that they are as open, accessible and democratic as possible, and that they can become a vehicle for promoting innovation itself.

2.6. On the other hand, urban innovations need the city as a space for experimentation to validate their usefulness, operation and generation of public value, before being scaled up to final, implementable and marketable products or services. It is of interest to the urban space (physical, social and political) to offer itself as a testing space to check whether the proposed solutions are of interest and usefulness for the city before scaling them up.

2.7. In line with the above, Barcelona City Council promoted a study for the implementation of artificial intelligence in traffic light regulation, together with the Polytechnic University of Catalonia, which can be consulted at this link (<http://hdl.handle.net/11703/147366>) and from which this challenge derives.

3. PURPOSE

3.1. The challenge poses a vision of the future in which traffic light control in Barcelona evolves towards a model based on artificial intelligence (AI), capable of continuously adapting to the real conditions of urban mobility.

In this context, each group of traffic light intersections is conceived as an autonomous control agent, based on machine learning models (neural networks, agentics, *multi-agent reinforcement learning* models or similar techniques), which make decisions based on the state of traffic, the demand of different users and the urban context. This approach opens up great potential for improvement in terms of traffic flow, reduction of travel times, reduction of polluting emissions and improvement of the quality of urban life.

However, the application of AI in a critical system such as traffic light control comes with clear restrictions and limits. Minimum road safety conditions must be guaranteed at all times, such as sufficient crossing times for pedestrians, the correct management of conflicts between movements and compliance with current regulations.

In addition, many existing solutions on the market have traditionally been designed with a vision focused on the private motorized vehicle, leaving other fundamental players in public space such as pedestrians, bicycles or public transport in the background. This challenge aims to promote more inclusive and multimodal approaches, aligned with Barcelona's sustainable mobility objectives.

4. CHARACTERISTICS OF THE URBAN CHALLENGE SUBJECT TO THE CALL

4.1. Urban challenge for the application of artificial intelligence to traffic light regulation

- (i) This call is posed as an urban challenge for the application of artificial intelligence to traffic light regulation, and the proposals presented must necessarily incorporate the following phases, for each of which it will be necessary to respond to the defined requirements and deliver at least one deliverable:

Phase 1: Data capture and integration

In Phase 1, it will be necessary to define how the necessary data will be captured and managed, ensuring that it is reliable, diverse and available in near real time. Specifically, it is necessary to propose an architecture and a strategy that make it possible to obtain relevant information on the state of traffic and the flows of vehicles and people, integrate it in a coherent way and facilitate its use for intelligent decision-making. Proposals that present a high degree of compatibility with the existing infrastructure and that, consequently, require a lower level of adaptation to it will be positively valued.

A deliverable must be submitted that includes, at least:

- Definition of the infrastructure and architecture necessary for data collection aimed at intelligent traffic control.
- Identification of the most appropriate detection technologies (cameras, sensors, connected vehicles, acoustic systems, etc.).
- Proposal of a clear strategy for the integration of data from different sources and platforms (Barcelona City Council, Catalan Traffic Service, TMB, ATM, among others).

Phase 2: Modeling and decision-making

In Phase 2, it will be necessary to define how traffic movements are modelled and how control decisions are made based on the available data. Specifically, it is necessary to propose the functional design of the smart system, specifying how artificial intelligence technologies are incorporated to improve traffic light management, balancing criteria of efficiency, equity and safety, and allowing adaptation to different objectives and public policy scenarios.

A deliverable must be submitted that includes, at least:

- Definition of the decision-making scale (corridor or network).
- Definition of the frequency of updating control decisions.
- Description of the level of anticipation of the system to respond to future situations.
- Definition of the criteria for prioritising the different types of users (public transport, pedestrians, bicycles, private vehicles, emergency vehicles, etc.).
- Proposal for the formulation of the objective function, which allows different configurations and their evolution without modifying the core of the system.
- Definition of the level of intervention on the current system, indicating the proposed AI technologies and justification of their adequacy, as well as the architecture of the system and the operating model. Proposals should explain the type of AI selected and how it contributes to the objectives of the solution.

Phase 3: Control and Operation Infrastructure

In Phase 3, it will be necessary to define how the smart traffic light control system is implemented and operated, ensuring its technical and operational feasibility. Specifically, it is necessary to propose a robust, scalable and realistic solution, capable of coexisting

with the existing infrastructure and of progressively evolving it, guaranteeing the security and continuity of the service.

A deliverable must be submitted that includes, at least:

- Description of the operating model of the AI-based traffic light control system on a day-to-day basis.
- Identification of communication technologies that allow the control centre to be connected in real time with traffic light regulators.
- Proposal of solutions for the integration of junctions with connectivity limitations or with existing old infrastructures.

Phase 4: Implementation of the pilot

In Phase 4, it will be necessary to define how the pilot test will be deployed and executed in a real environment. In this sense, it is necessary to implement and validate the solution, ensuring its operation in real conditions and analyzing the results and its scalability potential. The pilot test must be implemented at the corridor or area level (not at isolated intersections), with a minimum of 9 centralised traffic light intersections (connected to the control centre). The definition of these intersections will be carried out in coordination with the monitoring committee described in point 7.2. The implementation and execution phase of the pilot must have a minimum duration of 4 months. Proposals that minimize the necessary intervention on the existing infrastructure for the implementation of the solution will be especially valued.

The actions to be carried out are:

- Definition and preparation of the adaptation plan for the existing infrastructure, including the installation of the necessary sensor.
- Development, deployment and technological validation of the pilot solution in a real environment on public roads.
- Definition of the results analysis model and the pilot evaluation indicators.
- Definition of the operating conditions of the pilot, including immediate reversibility time, legal responsibilities, coordination model with the operational center and maintenance services, and procedures for action in the event of incidents.
- Preparation of the final results report described in point 11.2. *Final report*, including conclusions and knowledge transfer.
- Organization and realization of a *workshop* for the public presentation of the results of the pilot.

(ii) Innovative solutions are sought with:

- **Scalability:** Solutions that can be easily expanded and implemented throughout the city of Barcelona, beyond a specific area or location.
- **High impact:** With demonstrable impact and quantifiable return and lasting over time.
- **Short-term executables:** Maximum duration of 18 months between implementation and monitoring.
- **Innovative and differential component:** that uses innovative methodologies and resources in terms of planning and execution.

- (iii) The proposed solutions must achieve a **high** ¹TRL (between 7 and 9) in order to be implemented in real environments and with a pilot character. The solutions must therefore be able to be monitored, evaluated and optimised in the experimentation phase in the city, demonstrating the achievement of the impacts in time and in the spatial delimitation defined by the participant.
- (iv) Although the final solutions must have a high TRL (between 7 and 9), the process of developing the proposals may include phases of research, analysis, laboratory experimentation and prototyping, corresponding to a TRL between 5 and 7.
- (v) Those proposals that require a minimum intervention on the existing infrastructure during the execution of the pilot will be positively valued.

4.2. Areas of action

- (i) **The Monitoring Committee** described in section 7.2, will agree together with the winning participant(s) of the challenge where the solution will be implemented to comply with the characteristics defined by the proposal as a testing space.

4.3. Time

The solution must define the execution and monitoring times. The maximum duration of the project must be 18 months, of which the pilot phase with monitoring must be a minimum of 4 months. The pilot phase must allow the evaluation of the results and validation of the solution. In this phase, the solution can be intervened and optimized depending on the response it is having. A duly justified extension can be requested and in no case does it imply an increase in budget.

The justification report with the qualitative and quantitative results of the pilot detailed in point 11.2. *Final report* must be delivered no later than 3 months to be computed from the end of the pilot.

4.4. The impacts

- (i) Impact is understood to be the lasting or significant changes caused by an action or a combination of actions. In the context of this call, those that contribute to the application of artificial intelligence in traffic light regulation will be considered impacts.
- (ii) The expected impacts must be unequivocally derived from the exploitation of the results of the proposed project.
 - In particular, lasting impacts over time will be assessed, and therefore not limited to one-off benefits.
 - The proposals submitted must justify in a plausible and reasoned manner the potential impacts that are estimated to arise from the execution of their project.

¹ The TRL, *technology readiness level* of the project, is a concept used to measure the state of development of a technology in the broad sense (devices, materials, components, software, work processes, etc.). More information about TRL can be found at:
https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

- The impacts of each project must be able to be quantitatively and qualitatively verified during and at the end of the execution of the project. The proposal must define the appropriate verification indicators, which must include the contrast data, and the objective impacts to be achieved, as well as the procedure for measuring the defined indicators and impacts.
- The minimum values to be achieved for each of the proposed impact verification indicators must be specified. These indicators must be able to be measured in absolute values (units), relative values (percentages) or incremental values (growth or decrease over time), and must be limited in time and segregated by gender where appropriate. It will also be necessary to define the measurement process for each indicator.
- The procedure devised to proceed with the implementation of the project (and its impacts) must be developed in a clear and concise way.
- Those proposals that do not clearly and concretely identify the minimum values to be achieved at the end of the project, may be discarded in the review of eligibility of proposals.

5. BUDGET ALLOCATION

- (i) The challenge is endowed with the **MAXIMUM amount** of TWO HUNDRED THOUSAND EUROS (200,000.00 euros).

The selected projects will receive an amount equivalent to a maximum of 80% of the total amount of the proposed solution.

The projects that can participate in the call must have a minimum budget of 50,000.00 euros, without establishing a maximum budget limit.

The selected projects will receive an amount equivalent to 80% of their eligible costs with a ceiling of 100,000.00 euros per project.

The maximum amount that will be awarded for each project will be 100,000.00 euros, and the minimum, 40,000.00 euros.

The sum of the total amount awarded may not exceed the maximum amount of the call, i.e. 200,000.00 euros.

- (ii) The amounts awarded are understood in any case as net amounts, being subject to value added tax (VAT) in the corresponding amount according to current regulations, provided that this amount is applicable.

6. CALL

6.1. Requirements for participants

- (i) Legal entities that can develop a project proposal that responds to the needs and/or challenges posed, in accordance with the requirements established in the call, can participate in this call. Among others, and without limitation, associations, foundations, micro and small enterprises, cooperatives, individual entrepreneurs, universities, research centres and technology centres can participate.

- (ii) Groups of legal persons that, without having their own legal personality, can jointly develop a project proposal that responds to the needs and/or challenges posed, in accordance with the requirements established in the call.
- (iii) The grouped entities and individuals must meet, each of them individually, all the obligations and requirements set out in this call to be beneficiaries of the prizes and must appoint a representative of the group for compliance that, as a beneficiary, corresponds to the group.
- (iv) The requirements required of beneficiary legal persons, individual or grouped, and which must be duly accredited, are as follows:
 - Be legally constituted.
 - Have access to the Internet and/or electronic means, as well as a valid email address and contact telephone number that will be used to make notifications and communications of the specific call.
 - Be up to date with tax and tax obligations with the State Tax Administration Agency, as well as with Social Security. Debts that are deferred are considered to meet the requirement of being up to date with obligations.
 - In the case of non-Spanish companies or entities, they must prove that they are legally constituted and up to date with the fulfilment of their obligations by means of certifications issued in accordance with their national legislation.
 - Not to make false statements when providing the information required to participate in the call.
- (v) In the event that it is a group of legal persons, the following conditions must be met and accredited:
 - It will be necessary to appoint a representative or sole representative of the group for the fulfilment of obligations who, as a beneficiary entity, corresponds to each of the members of the group.
 - Modification of the composition of the group is not allowed. The change of representative of the group or the redistribution of the obligations and commitments for the execution of the project initially assumed by each member of the group will require the prior authorisation of Fira de Barcelona.
 - The designated entity or person will act as the group's dialogue and representation throughout the life of the award before Fira de Barcelona, and will be the one who will present the project and all the required documentation, receive the payments and distribute the corresponding part to the rest of the entities or people, while coordinating the different interventions of the different entities and people grouped.
 - The partner entities will have to participate in the definition and execution of the project jointly. Consequently, all partner entities will have the status of beneficiaries.
- (vi) The group, however, will have to designate a main organisation that will act as the sole representative before Fira de Barcelona
 - The implementation commitments assumed by each of the partner entities must be stated in the model grouping agreement provided by Fira de Barcelona.
 - The amount of the prize that will be applied to each of the entities must be expressly stated in the project budget proposal.
 - The entity or person designated as the group's representative will be fully responsible for the project vis-à-vis Fira de Barcelona with respect to the fulfilment

of the obligations established in this call, without prejudice to the liability of the other members of the group.

- The persons or entities that make up the group will be jointly and severally liable for the fulfilment of all the obligations arising from the awarding of this prize.

6.2. Proposal evaluation process

- The call for this challenge will be divided into **two (2) assessment phases**.
 - Phase 1: Pre-selection of proposals.
 - Phase 2: Selection of proposals.
- The total number of projects pre-selected in *Phase 1: Pre-selection of proposals* will be limited to a maximum of 10 projects, in accordance with the criteria established in section 8 of these Terms and Conditions.

6.2.1. Step 1. Pre-selection of proposals

Participants must submit their proposal via email bilm@firabarcelona.com.

The deadline for submitting proposals in Phase 1 will start from the day after their publication on the <https://www.tomorrowmobility.com> website and will end on Wednesday, May 20, 2026 at 18:00 CET. Once the deadline has ended, the submission of new proposals will not be accepted.

Once the deadline for submitting proposals in Phase 1 has ended, the period of analysis and evaluation of the documentation received will be opened, which will determine the proposals that can be submitted to Phase 2, once they have been preselected.

Participants may also send an email to the address bilm@firabarcelona.com all queries that participants have regarding these Rules, from Monday to Friday and until Wednesday 13 May 2026 at 14.00 CET.

6.2.2. Step 2. Selection of Proposals

The list of participants selected for the presentation of the extended proposal in Phase 2 will be published on the website <https://www.tomorrowmobility.com> Thursday, July 2, 2026. Likewise, those shortlisted will be contacted through the email that has been presented by the candidacy.

In Phase 2: *Selection of proposals*, participants who have been pre-selected for the second phase will have to submit, via email bilm@firabarcelona.com a more detailed and extended proposal of the project, as well as the documentation related to point 6.3 of this document, with a deadline of Friday 4 September 2026 at 18:00 CET.

All queries that participants have regarding these Terms and Conditions may also be addressed to this email address, from Monday to Friday and until Friday, July 28, 2026 at 12:00 p.m. CET, by email: (bilm@firabarcelona.com.)

The Selection Committee may convene an online Q&A session for the presentation and defense of the selected participants for the presentation of the extended proposal in Phase 2. In the event that the session is called, it will be informed in advance through the pre-selected candidates via email. The minutes resulting from the session will be incorporated into the file and will in any case be binding for the winning proposals.

The list of winning projects of Phase 2: *Selection of proposals* will be published on the <https://www.tomorrowmobility.com> website on Friday, October 9, 2026. Likewise, the winners will be contacted by means of the email that has been presented by the candidacy.

Fira de Barcelona reserves the right to extend the deadlines indicated, if so considered. In the event of an extension of deadlines, it will be duly communicated through the website where the Challenge is published. Participants are recommended to access the website periodically, in order to find out about all those news that are occurring in the same vein.

6.3. Technical and administrative documentation

- The proposal must be submitted through:
 - Phase 1: Sending to bilm@firabarcelona.com email
 - Phase 2: Sending to bilm@firabarcelona.com email

Participants will attach the required documentation and following the indications established in these Rules. The documentation can be submitted in Catalan, Spanish or English.

Fira de Barcelona will provide participants with the documentation and information necessary to participate in the two phases:

- Step 1. Pre-selection of proposals
- Step 2. Selection of proposals

In each of the phases, all the technical and administrative documentation that must be delivered will be detailed, as well as the templates enabled to complete for the technical documentation.

Phase 1: Pre-selection of proposals.

- a) **Application for participation.** Document referring to **Annex I** and containing the contact details of the applicant(s), basic details of the project and the declaration of responsibility of the person or representative of the applicant entity or group. In the case of groups, the declaration will be submitted by the person or entity designated, on behalf of all its members, as the representative of the group.
- b) **Simplified Phase 1 Executive Proposal. Technical report of the project of a maximum of 10 pages.** Document (**Annex III**) containing the basic data of the project and providing a general idea of the project and its development. It is also necessary to include three (3) response blocks on the excellence, impact and implementation of the project, responding to what is indicated in point 8 of these rules.
- c) In the case of a grouping of legal and/or natural persons, **the collaboration agreement must be provided for a group of natural and/or legal persons without legal personality**, signed by all its members, in accordance with the form provided in **Annex II**.
- d) Responsible declaration of the person submitting the proposal indicating: name and surname(s), address, NIF, telephone number and email.
- e) Responsible declaration that they are up to date with their tax and Social Security obligations, or those that correspond in accordance with their national legislation in the case of non-Spanish companies or entities.

The submission of additional annexes to the submission of the proposal will be accepted as complementary information with a maximum length of 10 pages but will not be taken into consideration for the evaluation of the proposal.

Phase 2: Selection of proposals.

The candidates selected for Phase 2: Selection of proposals must complete their proposal by providing the following documentation:

- a) **Extended executive proposal of the project** (maximum 25 pages). Report of the project that includes the following information, and contains, at least, the aspects detailed below, following the provisions of **Annex IV**:

- i. EXCEL· PROJECT FOCUS: executive summary, project excellence, objectives and expected results, concept and methodology, cross-cutting approach, alignment with challenges, innovative component, proposed technical solution, technological maturity and feasibility, additional aspects of social inclusion and gender equity.
- ii. IMPACT OF THE PROJECT: potential impacts, other impacts, exploitation of results, communication and dissemination plan.
- iii. IMPLEMENTATION OF THE PROJECT: work plan (specifying the pilot and prototyping phase and the results monitoring phase, among others), planned activities, budget, project management, replication and scalability, contribution of people who will carry out the proposal, investment in technology, use of open methodologies. Needs for testing solutions: Focus group, Public space, and Urban assets. The process of implementation of the project must therefore be identified.

b) **Economic report of the project. Forecast of the project budget.**

This document incorporates the forecast of the project budget and the breakdown of the project between personnel costs, direct costs, external contracts, indirect costs and investments, as indicated in **Annex V**. In Phase 2, the total amount requested cannot be modified.

The submission of additional annexes to the submission of the proposal will be accepted as complementary information with a maximum length of 25 pages, but will not be taken into consideration for the evaluation of the proposal.

In all those chapters that are limited in their length, the assessment of those will not be carried out.

7. GOVERNANCE BODIES

7.1 Selection Committee

- (i) The Selection Committee will have the following composition:
 - A representative of the Barcelona City Council's Mobility Department
 - A representative of the Bit Habitat Foundation
 - A representative of Fira Internacional de Barcelona
 - A representative of the Polytechnic University of Barcelona
- (ii) If necessary, a working group may be created to advise the Selection Committee, which will be made up of independent expert evaluators appointed by the Selection Committee itself.
- (iii) The Selection Committee will have the following powers:
 - Evaluate the proposals in both phases and decide on the admission of these proposals.
 - To issue the verdict regarding the finalist proposals.
 - Resolve any doubts or incidents that may arise in relation to the evaluation process.

7.2 Monitoring Committee

- (i) The Monitoring Committee will have the following composition:
 - A representative of the Barcelona City Council's Mobility Department

- A representative of the Bit Habitat Foundation
- A representative of Fira Internacional de Barcelona
- A representative of the Polytechnic University of Barcelona

(ii) Additionally, if necessary, a project management office can be hired to provide expert support to the Monitoring Committee.

(iii) The Monitoring Committee will have the following powers:

- Validate the follow-up reports submitted by the winner
- Request ad hoc documentation in relation to the execution of the pilot.
- Resolve any doubts or incidents that may arise in relation to the project monitoring process.

8. ASSESSMENT CRITERIA

8.1. PHASE 1: Pre-selection of proposals

(i) The evaluation of each proposal in Phase 1 will be carried out according to the following evaluation criteria:

Criterion 1. Project excellence	Value*	
Quality and coherence of the proposal in the definition of data capture and integration, including architecture, source detection and integration technologies.		Maximum of 5 points
Robustness of the traffic model and decision-making system with AI, including scale, frequency, anticipation, and target function.		
Clarity in the definition of the criteria for prioritising the different users and adapting them to different public policy scenarios.		
Degree of innovation in the use of artificial intelligence and in the design of the traffic light control system.		

Criterion 2. Impact	Value*	
Relevance of the expected impacts on the improvement of urban mobility and the management of traffic flows.		Maximum of 5 points
Ability of the solution to generate measurable results through indicators defined in the pilot.		
Scalability of the solution at urban network scale and replicability in other environments.		
Contribution to a more efficient, secure and balanced management of the different types of users.		

Criterion 3. Implementation	Value*	
<p>Technical, operational and economic feasibility of the solution, including a coherent and justified budget, as well as its integration with the existing infrastructure.</p> <p>Minimal intervention on the existing infrastructure, as well as the coherence and solidity of the pilot implementation plan in a real environment.</p> <p>Quality of the operating model and real-time communication technologies, as well as the ability to deploy in environments with connectivity limitations or old infrastructures.</p> <p>Robustness of the system and guarantee of continuity of service, including mechanisms for immediate reversibility to the current system in the event of an incident, associated response times and the existence of contingency plans.</p>		Maximum of 5 points

A maximum of 10 projects will be selected for the next phase and will be ordered from highest to lowest score, as indicated in section 6.2. of these rules.

8.2. PHASE 2: Selection of proposals

(i) The evaluation of each proposal in Phase 2 will be carried out according to the following evaluation criteria:

Criterion 1. Project excellence	Value*	
Subcriteria		
1. Clarity and coherence of objectives and results in relation to smart traffic light regulation in a real urban environment.		Maximum of 5 points
2. Degree of detail, maturity and consistency of the solution in the phases of data capture and integration and modelling and decision-making with AI.		Maximum of 5 points
3. Adequacy and justification of artificial intelligence technologies and the decision-making model (scale, frequency, anticipation and objective function).		Maximum of 5 points
4. Clarity in the definition of the criteria for prioritising different types of users and adapting to different mobility scenarios.		Maximum of 5 points
5. Degree of innovation of the solution, including energy efficiency and its integration into the urban environment.		Maximum of 5 points
6. Robustness and reliability (technological and social) of the artificial intelligence technologies to be used in the proposed solution (e.g. to ensure a low level of error).		Maximum of 5 points

	Rating 1	Total Points
	<i>Minimum score per Criterion: ≥ 3.1</i>	

Criterion 2. Impact of the project	Value*	
Sub-criteria		
1. Relevance and scope of the expected impacts on improving urban mobility, including reducing congestion and waiting times, improving fluidity and reducing emissions.		Maximum of 5 points
2. Quality, coherence and traceability of the indicators defined for the evaluation of the pilot, including the availability of baseline data, the measurement methodology and the target values to be achieved.		Maximum of 5 points
3. Degree of scalability of the solution at urban network scale and its replication capacity in other environments, considering its integration with existing systems.		Maximum of 5 points
4. Contribution to a more efficient, secure and balanced management of the different types of users, including the prioritization of users.		Maximum of 5 points
5. Feasibility of integrating the solution into the real operations of the administration, including its sustainability once the pilot has been completed.		Maximum of 5 points
6. Compliance with data protection regulations and adequacy of procedures to ensure safe and responsible use of information.		Maximum of 5 points
	Rating 2	Total Points
	<i>Minimum score per Criterion: ≥ 3.1</i>	

Criterion 3. Project implementation		Value*	
Sub-criteria			
1. Coherence and solidity of the work plan in relation to the phases of the project, including activities, time planning, resources and organization.			Maximum of 5 points
2. Technical, operational and economic feasibility of the proposed solution, including a coherent and justified budget and its integration with the existing traffic light infrastructure.			Maximum of 5 points
3. Quality of the system's operating model and real-time communication technologies between the control centre and the traffic light regulators.			Maximum of 5 points
4. Coherence and detail of the pilot implementation plan, including the deployment in a corridor or area with a minimum of 9 intersections in real conditions and the ability to deploy in environments with connectivity limitations or old infrastructures.			Maximum of 5 points
5. Robustness of the system and guarantee of continuity of service, including mechanisms for immediate reversibility to the current system, response time to incidents and the existence of contingency plans.			Maximum of 5 points
6. Adequacy of the project management team and structure, as well as the identification and management of associated risks.			Maximum of 5 points
	Rating 3		Total points
	<i>Minimum score per Criterion: ≥ 3.1</i>		

(ii) The assessment of each criterion corresponds to the average grade of its corresponding sub-criteria.

(iii) In the event of a tie, the order of the following prioritization of criteria will prevail: Criterion 2. Impact of the project; Criterion 1. Excellence of the project; Criterion 3. Implementation of the project.

(*) Minimum value required for each of the three criteria is ≥ 3.1

(*) The value of each sub-criterion is scored from 0 to 5 out of 0.5.

The correspondence of scores is:

- **0 to 2 points:** Does not meet the sub-criterion;
- **2.1 to 3 points:** achieves the sub-criterion sufficiently;

- **3.1 to 4 points:** achieves the sub-criterion well;
- **4.1 to 4.5 points:** achieves the sub-criterion very well
- **4.6 to 5 points:** achieves the sub-criterion excellently.

- (iv) The winning proposals and, therefore, beneficiaries of the amount awarded, will be those that obtain a higher score taking into account the assessment obtained according to the previous table.
- (v) The total score of each project will be given by the sum of the average scores of each criterion, since the maximum score that the proposals presented can obtain will be 15 points.
- (vi) Any proposal that has not exceeded the threshold of 3.1 points in each of the three specified criteria (average grade of its corresponding sub-criteria) will not be considered.
- (vii) The winning proposals must obtain at least an overall average score of 4.

9. GRANTING OF THE AMOUNT

9.1. Concession and resolution procedure

9.1.1. Admission and assessment

- (i) Once the documentation detailed in section 6.3 has been submitted, it will be verified that they comply with the requirements defined in these regulatory bases. In the event that the applicant has not provided the documents indicated in the call, they may be required to amend or supplement the documentation submitted.
- (ii) The Selection Committee will assess the proposals submitted, in accordance with the criteria indicated in section 8 of these rules, " *Assessment criteria* ", and will select the winning proposal(s).

9.1.2. Resolution of the call, notification and acceptance.

- (i) It will be published on page <https://www.tomorrowmobility.com> and the participants who have submitted the winning proposals will be notified and will be required to submit the documentation indicated in section 9.2 of these Terms and Conditions within ten (10) working days.
- (ii) Once the documentation has been submitted and once it has been analysed, in the event that it is considered correct, the challenge in favour of the winning proposals will be definitively resolved, and it will be published on the <https://www.tomorrowmobility.com> website.
- (iii) In the event that the documentation submitted in any of the phases is incomplete or erroneous, an additional period of five (5) working days will be granted for its correction.
- (iv) In the event that any of the initially selected winning companies do not submit the required documentation within the established deadlines, Fira de Barcelona reserves the right to propose the award of the challenge to the next best valued proposal.
- (v) The competence for the award resolution will be, in any case, Fira de Barcelona.

9.1.3. Payment

- (i) The winning proposals will receive an amount of up to 80% of the expected cost of the project, with a maximum economic amount of €100,000.00 per project. This funding may be used **solely and exclusively** for activities related to the development/implementation

of the proposal and must be justified in accordance with the provisions of these Terms and Conditions.

- (ii) In addition, the winner will benefit from:
1. Possibility of establishing relationships with other actors in the ecosystem and interest groups that Fira de Barcelona may promote within the framework of the obligations of the collaboration agreement.
 2. Possibility, where appropriate, of making use of a space at the Montjuïc exhibition centre.
 3. Local and international visibility as a result of communication, dissemination and promotion activities.
- (iii) The payment of the determined amount will be made in instalments and conditioned on the achievement of verifiable milestones during the development of the challenge, in accordance with the following distribution and with the mechanisms established in these Rules:
- **First payment:** 30% of the amount determined, once the required documentation has been validated in accordance with clause 9.2. Additional documentation.
 - **Second payment:** 60% of the amount determined, at the time of the launch of the pilot, after validation by the BILM.
 - **Third payment:** 10% of the budget of the determined amount, once the delivery of the final report of the project has been presented and approved.
- (iv) During the procedure for awarding the amount, Fira de Barcelona may propose the modification of the conditions or way of carrying out the proposed activity of the winning proposal. By the applicant; In this case, you must request the acceptance of the beneficiary. This acceptance will be understood to have been granted if the proposed modification clearly sets out the variations and the beneficiary does not express his or her opposition within fifteen working days of notification of the proposal and provided that, in any case, there is no damage to third parties.

9.2. Additional documentation

The winning legal entities must reliably accredit:

- Data relating to legal personality and its capacity to act, and the representation with which the signatory acts when it is registered in a public register.
- Statutes of the legal entity.
- Registration of the legal entity in the corresponding register.
- CIF of the legal entity.
- Photocopy of the DNI/NIF of the person signing the application and documentation accrediting the representation, if they are not registered in the register. It is not necessary to provide this documentation if the electronic signature proves that the signatory has sufficient powers to act on behalf of the person represented.
- Certificates from the Tax Agency and Social Security certifying that there are no outstanding debts with these administrations.
- Document of receipt of the amount (according to the model provided by Fira de Barcelona).
- Fira de Barcelona Third Party Registration Form.
- Certificate of bank ownership certifying that the account number where the payment is to be made is owned by the company.
- Invoice corresponding to the first payment.
- Consent document for the use of the image and voice included in Annex VIII.

10. OBLIGATIONS OF THE BENEFICIARIES

10.1. The beneficiaries of the Challenge will be obliged to:

- To disseminate that the activity has been funded by the Barcelona Innova Lab Mobility Project by stating in the printed material or other means of dissemination the corresponding phrase together with the logo of the institutions promoting the Project, which will be delivered to them in a digital file.
- To make quality material available for the dissemination of the projects (for example: images, videos, project documentation) for Barcelona Innova Lab Mobility and the companies associated with the launch of the challenge.
- Carry out the activity that is the basis for the granting of the amount associated with the challenge.
- Justify the application of the funds received, as well as the performance of the activity and the fulfilment of the purpose that determines the granting of the amount associated with the challenge.
- Communicate any significant alteration that occurs after the granting or, where appropriate, the corresponding waiver.
- Collaborate in verification and information actions that may be of interest to Fira de Barcelona.
- To have the accounting documentation that may be required in order to guarantee the powers of inspection and control.
- To keep the documents justifying the application of the funds received, including electronic documents, for as long as they may be subject to verification and control actions.
- To carry out a responsible use of the personal data collected and processed during the execution of the pilot.
- To have, during the execution of the entire project, a current civil liability insurance policy, with a minimum insured capital of 1,500,000 euros, which covers possible damages to third parties derived from the activity carried out within the framework of the challenge. The policy must be issued prior to the start of the execution of the pilot, providing a copy of it and the payment receipt for subsequent validation by the Monitoring Committee described in point 7.2.
- Carry out the *workshop* corresponding to *Phase 4: Implementation of the pilot* of point 4.1 *Urban challenge for the application of artificial intelligence to traffic light regulation*, in which the results of the project will be publicly presented in the terms established in the rules.
- Submit the documentation provided for in point 4.1 *Urban challenge for the application of artificial intelligence to traffic light regulation*, in accordance with the established requirements and deadlines.

10.2. In any case, Fira de Barcelona will be exempt from civil, commercial, labour or any other liability arising from the actions to which the persons or entities receiving the amount awarded are obliged.

10.3. The beneficiaries must have started the implementation of the proposal in accordance with the schedule defined in their proposal, and in any case, within the maximum period determined in the call from the awarding of the amount.

11. JUSTIFICATION, MONITORING AND CONTROL OF PROJECTS

11.1. Project monitoring and Monitoring Committee

- (i) A Monitoring Committee will be set up, described in section 7.2, which will ensure the correct deployment of the winning solution and will evaluate the degree of compliance with the planned objectives.
- (ii) To ensure proper accountability and highlight the value of the winning projects, the beneficiary projects must share with the Barcelona Innova Lab Mobility Monitoring Committee a follow-up report prior to the issuance of the invoice for 60% and 10% of the budget of the amount awarded.
- (iii) The beneficiary legal entity will send the monitoring reports indicated by the Monitoring Committee. The monitoring report will consist of:
 - An action report with an indication of the activities carried out, as well as the impact generated.
 - An economic report that will include a classified list of expenses and a detailed and numbered list of other income or subsidies that have financed the activity, indicating the amount and origin of the activity.
- (iv) The beneficiary legal entity will send the detailed reports in section 4.1. *Urban challenge for the application of artificial intelligence to traffic light regulation* at the end of each of the corresponding phases.

11.2. Final report

- (i) In addition to the final action and economic report submitted prior to the issuance of the last invoice of 10% of the budget for the determined amount, the beneficiary must present the justifying account signed by the legal representative or by the signatory of the application for the amount granted, which must include the details of the cost of the activities carried out, and their documentary justification:
 - Supporting account with the provision of a mandatory auditor's report.
- (ii) This must contain the action report indicating the activities carried out and the results obtained, the economic report justifying the cost of the activities carried out and the audit report.
- (iii) The tentative index of the action report will correspond to the following structure:
 - Executive summary
 - Objectives and scope of the pilot
 - Evaluation methodology and data
 - Results obtained (quantitative and qualitative)
 - Assessment of results (achievement of objectives and key factors)
 - Potential for improvement with AI in traffic light management (opportunities and risks)
 - Recommended AI Technologies
 - Architecture and deployment and operation model
 - Scaling roadmap (phases, requirements, validation)
 - Conclusions, recommendations and next steps
 - Appendices (detailed KPIs, data, extended results)

11.3 Refund and waiver

- (i) Fira de Barcelona may demand a total or partial refund of the amounts awarded in the following cases:
 - Due to the lack of justification or incomplete justification of the amount received.

- For failure to comply with the purpose of the challenge or the other conditions established in this call.
 - For non-compliance with the conditions imposed on the beneficiaries on the occasion of the granting of the amount associated with the challenge.
 - For resistance, excuse, obstruction or refusal to the verification and control actions.
- (ii) Likewise, in order to guarantee compliance with the pilot execution schedule agreed at the kickoff meeting, Fira de Barcelona, through the Monitoring Committee, may establish penalties in cases of unjustified delays that are directly attributable to the management of the winning solution, excluding any cause arising from factors beyond its responsibility.
- (iii) In the event that the results obtained present disparities over the project, the veracity of the impacts will be verified. If through this verification it is resolved that the expected results to be achieved have not been achieved:
- In the event of deviations of more than 20%, it will be necessary to communicate and justify it for the reformulation of the project. The validity of the arguments provided to accept the deviation of the results achieved with respect to those expected will be considered.
 - In the event that the justifications are not accepted, a percentage proration of the amount to be refunded will be made, calculated according to the percentage of deviation.
 - In the event of deviations of more than 50%, as a result of negligence or lack of due diligence on the part of the beneficiary, a refund of the total amount will be claimed.
- (iv) The winner may voluntarily renounce the project. The resignation must be prior to the start of the financed activity or its collection; otherwise, beneficiary the winner will have to refund the amounts received.

12. LIMITATION OF LIABILITY

12.1. Fira de Barcelona reserves the right to reject any proposal or to withdraw a place in the call if a participant fails to comply with these rules or in the event of a potential conflict of interest. Fira de Barcelona will not be responsible for or reimburse the costs arising from the submission of materials or information in accordance with the call, including the evaluation, response, monitoring, negotiation or any other costs incurred in meeting the requirements of the call together with the implementation of the proposal.

12.2. By applying for the call, participants:

- They are responsible for the authorship and originality of the projects presented, as well as for the copyright and other intellectual or industrial property rights on any material, product and/or computer programs or software (whether in printed or machine format).
- They guarantee that they do not infringe any rights of third parties, whether industrial, intellectual or any other type of property.
- They acknowledge that they are also legitimate holders, or assignees, of the full ownership of the media of any kind, including, by way of example and without limitation, of the documentation and any supports or materials of an analog, magnetic and/or digital type, in which the object of the project materializes and fixes, in whole or in part.
- They guarantee that they are the owners of the intellectual and/or industrial property rights related to the ideas that they submit to this call and of all creations, databases, tools, methodologies, processes, technologies, know-how, software and products in general.

12.3. The results of the evaluations of each round are final and binding. Fira de Barcelona is exempt from any liability, sanction, claim or demand in civil, commercial, criminal and administrative proceedings, including compensation of any kind or nature, as well as any expense (expressly including lawyers' and solicitors' fees), arising from the winning project as well as its subsequent implementation in the city of Barcelona.

12.4. The decision of the members of the jury during the evaluation is final and Fira de Barcelona will not enter into any discussion about the result.

13. INTELLECTUAL PROPERTY

13.1. The owner or owners of the participating projects will be the owners of the intellectual and industrial property rights as well as the *know-how* on the proposal submitted and on its development (hereinafter, the "Results").

13.2. Given the public purpose of the Barcelona Innova Lab Mobility, the beneficiaries agree to transfer the exploitation of the "results" free of charge, so they must share or make public the results so that they can be incorporated into subsequent bidding and public procurement processes by Barcelona City Council. In particular:

- Sufficient information must be provided to Barcelona City Council so that it, or any other public law entity designated by Barcelona City Council, can tender, through one of the public procurement procedures, the manufacture, development, distribution, installation or marketing of a solution with characteristics similar to those mentioned, so that any third party can submit to the aforementioned tender.
- The beneficiaries guarantee that they will share with Barcelona City Council sufficient information relating to their prototype proposal, so Barcelona City Council reserves the right to disclose or share it in order to ensure that contractors can manufacture, develop, distribute, install or market a product with similar characteristics, without economic consideration to the beneficiaries for the use of this information and results.

13.3. Barcelona City Council and the beneficiaries will sign, at the appropriate time of execution of the winning project or at a later time, a detailed license agreement on the "Results" in favour of the former, which will include, at least, the provisions of this clause.

13.4. This detailed license agreement will be negotiated in good faith by all parties and will take into account the concerns expressed to you by the beneficiaries in order to protect the "Results" and obtain an economic benefit from them.

13.5. The beneficiaries will be held harmless for any judicial or extrajudicial claim, Barcelona City Council, as well as any successful bidder or contractor or entity to whom Barcelona City Council transfers or sublicenses the rights established in these rules.

13.7. Participants exempt Barcelona City Council from any liability arising from the contents and use made of the projects by third parties.

13.8. In the event that it is found that the winners of the challenge are not the authors of the original projects, they will be obliged to reimburse Fira de Barcelona the amount of the financial endowment awarded, without prejudice to the requirement of the appropriate responsibilities. To make the amount to be refunded, the corresponding late payment interest will be added.

14. DATA PROTECTION

Fira de Barcelona will process the personal data provided within the framework of this call, as well as its updates, under the provisions of this clause. Fira de Barcelona will only communicate the data when strictly necessary. In any case, the data will be treated with a level of protection in accordance with the applicable data protection regulations and will not be subject to automated decisions. In the event that personal data of third parties is provided, Fira de Barcelona is guaranteed that they have been informed, prior to inclusion, of the content of this clause and will be personally liable to Fira de Barcelona for any damages that may arise in the event of a contravention.

Privacy Policy and information on Personal Data Protection

Responsible	FIRA INTERNACIONAL DE BARCELONA with CIF Q-0873006-A and registered office in Barcelona, Av. Reina M ^a Cristina s/n 08004.
Purpose	To process your data in relation to your participation in the urban challenge of reference.
Legitimacy	Consent of the Data Subject
Recipients	No data will be transferred to third parties.
Rights	Participants may exercise at any time, under the terms established in current legislation, their rights of access, rectification, deletion of data, limitation of processing or opposition, as well as request the portability of their data, by writing to the address Avenida Reina Maria Cristina s/n 08004 in Barcelona, or to the email address lopd@firabarcelona.com , clearly indicating the right to be exercised, accompanied by the national identity document or similar identification document that proves the corresponding identity.
Additional info	You can consult additional and detailed information on Data Protection in the Bases of the Urban Challenge of reference published in https://www.tomorrowmobility.com

15. COMPLIANCE WITH REGULATION (EU) 2024/1689 ON ARTIFICIAL INTELLIGENCE ARTIFICIAL INTELLIGENCE

The technical solutions, tools, systems or developments proposed within the framework of this challenge and that incorporate, are based on or make use of artificial intelligence systems must in all cases and fully comply with the provisions of Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024, establishing harmonised standards on artificial intelligence, as well as any provision that develops, complements or replaces it.

In particular, participants in the challenge will have to ensure that these solutions comply with the applicable obligations depending on the type and level of risk of the artificial intelligence system determined by the Regulation itself, including the requirements relating to prohibited practices, high-risk systems, transparency, governance, risk management, the protection of fundamental rights and human supervision.

Failure to comply with this obligation may result in exclusion from the proposal.

The participant in the challenge (provided that it is the winner of the challenge) must have and keep updated, throughout the duration of the project, the necessary technical and legal documentation that accredits compliance with Regulation (EU) 2024/1689, including, where appropriate: i) the functional description of the artificial intelligence system; ii) the classification of the system according to the applicable level of risk; iii) the technical and organisational measures adopted; iv) human oversight mechanisms; and v) the records, evaluations or reports required by the applicable regulations.

This documentation must be made available within the period determined, which must be compatible with the needs of control and supervision of the solution proposed by the challenge in its implementation.

During the implementation of the pilot, all control, verification or audit actions of a technical, organisational or legal nature will be carried out in order to verify compliance with the obligations arising from the use of artificial intelligence systems.

The winner of the challenge will be obliged to actively collaborate in the control and audit actions and to facilitate access to the relevant information, systems, records and documentation, as provided for in the regulatory body of the aforementioned Regulation.

16. NULL · VALIDITY OF CLAUSES AND CONSULTATION AND RESOLUTION OF DOUBTS

16.1. If any section of these terms and conditions is declared, in whole or in part, null or ineffective, such nullity or ineffectiveness will only affect the provision or part of a provision that is null or ineffective and will remain in all other terms and conditions. This provision or the part thereof that is affected will be considered not included, unless, if it is essential for these bases, it should affect them in a comprehensive manner. In this way, any situation not resolved in these rules will be raised directly with Fira de Barcelona, as the organiser of this challenge, which will dictate the solution to the proposed incident, which at all times will be binding on the established rules and will be communicated in writing to the affected participant.

16.2. To make queries or resolve any doubts related to the purpose of the call or the presentation of participation, interested parties may contact Fira de Barcelona through the bilm@firabarcelona.com email address.

17. GOVERNING LAW AND JURISDICTION

17.1. The law applicable to this call is Spanish law.

17.2. By submitting a proposal, the participants irrevocably accept the jurisdiction of the courts of Barcelona for any dispute or litigation that may arise in relation to these rules.

18. LANGUAGE OF THESE RULES

18.1. These Terms and Conditions may be consulted in three languages, Spanish, Catalan and English, although the Catalan version will prevail over the others in the event of any controversy.