



ASSOCIATION MONDIALE DE LA ROUTE
WORLD ROAD ASSOCIATION
ASOCIACIÓN MUNDIAL DE LA CARRETERA

LA GRANDE ARCHE
Paroi Sud - 5e étage
92055 La Défense Cedex - France

T +33 1 47 96 81 21
@ info@piarc.org
W www.piarc.org

Electric road systems: a solution for the future?

CALL FOR PROPOSALS

Deadline: January 31st, 2018

1 PURPOSE AND STRATEGIC SIGNIFICANCE

1.1 Introduction

The World Road Association (PIARC) has established a Special Projects fund to enable it to respond outside the usual four-year Technical Committee cycle to emerging issues and priorities identified by its members. This paper is a Call for Proposals to conduct the “Electric Road Systems (ERS) – a solution for the future?”

1.2 Definition of Electric Road System (ERS)

All aspects of system providing dynamic electric vehicle charging either conductive or inductive on roads.

1.3 Purpose

In the future road transports will need to rely on other energy sources than fossil fuels. One possible alternative for vehicles is to run on electricity supplied along the road (Electric Road systems – ERS).

How does the development of ERS look all over the world? In Sweden there are two test sites where two different technologies are demonstrated on public roads and in Germany there will be tests done in three regions. There are also more activities in USA, France, Israel, South Korea and Britain and probably in many more countries but not yet commonly known. PIARC aims to share experience and knowledge in this field in order to learn from each other.

This project aims to give an overall picture of the situation regarding development and implementation of ERS and the pros and cons of different technologies. With this project PIARC aims to build and share a common picture of what is happening in the ERS area around the world.

Although we understand ERS as limited to dynamic charging, the ERS is impacted by the development of other technologies such as static charging (e.g. conducting charging in parking slots, inductive charging on bus stops, etc.). Therefore, the project will focus on ERS (understood as dynamic charging) but it will make reference and analyse the impact of other technologies on ERS, particularly the static charging applications.

2 METHODOLOGY AND APPROACH

2.1 Description of ERS with regard to their TRL (Technology Readiness Level) and the players involved with the development

1. Assessment of different technologies (using both conductive and inductive solutions) regarding their TRL and description of the players involved in the development

Different technologies (both conductive and inductive) are developing in universities, research institutes, industries and companies (both SMEs and large companies). There are different statements and reports of their functionality and how close they are to market introduction. Assessment of their TRL give a lead to in what timeframe we can expect ERS to be a part of the road transport system. The task is to describe different Electric Road Systems regarding to their TRL.

2. The different technologies are developing in different parts of the world and are fostered by different players. In USA, for instance, the inductive technologies seem to be preferred, but in Europe the conductive technologies are more in fashion. The task is to describe players around the world with regard to their involvement, incentives and their ambition in ERS development.
3. The business model of ERS is still to be assessed, above all to cover the huge investments on infrastructures, but also the operation. Different players may be involved, not only the road owners and operators. The depreciation of the on-board equipment to electrify trucks and to install the electricity caption devices should be integrated in the transport business model. The task is to describe the different scenarios and business models that are under discussions among the actors.

2.2 Comparison of different ERS technologies with regard to their pros and cons

The task is to describe ERS technologies with regard to their pros and cons in the following fields;

- Their possibilities to be used by different type of road vehicles and their future main traffic market. (Heavy and light freight transport, public transport, private cars)
- Their potential to reduce use of energy and emission of greenhouse gases and its contribution to the decarbonization of road transport.
- Their potential of reducing toxic emissions and pollutants (e.g. NOx).
- The safety and security issues of each system.
- The reliability and failure scenarios
- Environmental impact such as visual impacts.
- Land requirements.
- Operations and maintenance (e.g. winter operations with de-icing issues, additional cost in pavement, bridges and tunnels maintenance due to electric roads).
- Intellectual Property Rights (IPR) connected to each ERS.
- The prerequisites for each ERS operability such as regulations, road infrastructure, vehicle-to-road communication and payment systems.

- Their potential to be combined with other technologies (drive systems) for reducing climate and toxic emissions.
- All the requirements that could be drivers or impediments to the actual deployment of these ERS. This includes cost elements on the infrastructure and the vehicles, technology development, safety of users, safety of pedestrians, compatibility with existing infrastructure such as bridges, tunnels, etc.
- Calendar indications about possible actual deployment scenarios, including possible coordination with the actual deployment of autonomous / automated vehicles.
- Brief comparison with static charging (conductive or inductive) approaches for strategic roads and possible impacts to ERS of these approaches.

It is essential that the study focuses on the needs of PIARC members, especially national road administrations and road operators. This study should provide high-level guidance that will help them make decisions such as investments on infrastructure, support to innovation, test beds, partnerships, etc.

2.3 Business model from Road Administration perspective

- The report should conclude on feasibility and future development of ERS through the analysis of a business model from Road Authorities perspective, in order to provide some clarification to the question “Electric roads: a solution for the future?”

2.4 Approach

Proposals in response to this Call should include a description of the approach to be taken to collect and compile the information being requested. The proposal should answer the following questions about the tenderer’s approach:

1. How will the study collect international information regarding, development, production and use of respective ERS?
2. How will the study collect ERS examples, particularly those related to standards and regulation of ERS?
3. How will the study identify ERS successes or areas for improvement?
4. How the study will analyse the impact to ERS of static charging developments and other vehicles propulsions?
5. How the study will analyse a business model from Road Administration perspective to bring some light to the question “Electric roads: a solution for the future?”
6. What will be the study milestones?

2.5 Key areas

Please describe the key areas for consideration in the framework:

1. What will be the study’s means of collecting information from different areas of road administration, academia and relevant industry (i.e. planning, asset management, design, construction, operations, and maintenance) from international road sector including successful and unsuccessful case studies?
2. Low and middle-income countries (LMIC) represent an important share of PIARC membership and it is crucial that their needs are addressed within PIARC activities. How will case studies from LMIC be gathered and how their need will be taken into account?

3 FINAL DELIVERABLES

The final deliverables will comprise:

1. A **report** presenting a map of strategies and actions concerning Electrical Road Systems and its contribution to decarbonization of road transport. What kind of road transports are targeted? What measures are used or suggested? Thoughts about changes in the road environment? Which players are primarily involved? Thoughts about ownership and changes in roles? And see if there is an interest for a specific international conference regarding Electric Road Systems.
2. A chapter inside the report with possible **specific recommendation for LMIC**.
3. A chapter inside the report with specific recommendations for road administrations and road operators.
4. A chapter inside the report with specific recommendations for PIARC. This includes recommendations to liaise with specific industries, take part in existing conferences or set up a new conference (or not), or a new technical committee on the subject.
5. Presentation material to present the results of the Special Project at PIARC Council meeting on October 24th and 25th 2018, and for the World Road Congress in Abu Dhabi in October 2019.

The final products will be submitted in electronic form in English. The World Road Association will ensure translation into French and Spanish. In addition, they will make it available for free in the World Road Association's Virtual Library to ensure a large world outreach for the report.

4 KEY DATES

The proposal should also include a proposed draft of a work schedule. The schedule should identify dates or time frames for accomplishing major milestones in the project. The work schedule will include bi-monthly status reports and dates or time frame for an interim product or products that allows adequate time for review and feedback prior to the final deliverable. The schedule should also include a proposed schedule for monthly conference calls to report on progress. The schedule must be completed, and all final products delivered by September 15th, 2018, so PIARC can proceed to translation and dissemination of document in advance to participants to PIARC Council meeting.

5 PROPOSED BUDGET

Please provide a general budget for the project. The funding requested from PIARC should not exceed 25,000 Euros. The budget should include a general itemization of the costs of the major work elements of the project.

6 PROPOSED EXPERTS AND INTERNATIONAL NETWORK

The proposal should also include a description of the relevant expertise that qualifies the tenderer to undertake the project. Specifically:

1. Please describe any past or current work projects that relate to the subject of this proposal.
2. Please also identify the person or persons who will be working on this project, describing their roles and estimated contribution to the project, and providing information on their backgrounds, experience and expertise.
3. Please provide information about any other international network, other than the World Road Association, from which tender could be leveraged from

7 PROJECT OVERSIGHT

The project will be overseen by a project evaluation and steering committee called “Project Oversight Team (POT) to select the preferred supplier and assist in the development of the project. These experts will be drawn from PIARC membership, and will include representatives from Technical Committees B.4 Freight transport, D1 Asset Management, E.2. Environment Considerations in Road projects and Operations and the PIARC Executive Committee.

The POT will assess tenders and select the preferred supplier on the basis of its assessment of:

- how well tenders address the project objectives and deliverables;
- the value for money offered by the tenderer, including additional contributions leveraged by the project; and
- the capacity of the tenderer to deliver the specified outputs.

The POT will oversee progress of the Project, including participating in periodic calls, bi-monthly status reports, reviewing interim and final products. The POT will also provide any relevant information from the PIARC work to the selected tenderer (e.g., information obtained from surveys) for use in the project. In addition to review and oversight by the POT, input may also be sought from the other members of Technical Committees B.4. Freight Transport, D.1 Asset Management, E.2. Environment Considerations in Road projects and Operations and the PIARC Executive Committee, and from members of any other relevant PIARC Technical Committees.

8 PROPOSAL SUBMISSION

Proposals should include the elements identified in this Call for Proposals. Specifically, they should include:

1. An outline of the Approach to be used for the project, including responses to the questions in Section 2.2;
2. An identification of the key issues to be considered, including the information requested in Section 2.3;
3. A work schedule, as described in Section 4.
4. A budget, as described in Section 5.
5. A list of proposed experts and possible international networks, as described in Section 6.

Proposals should be submitted electronically in English to the World Road Association General Secretariat at:

info@piarc.org

no later than:

January 31st, 2018

For any questions, please send E-mail to info@piarc.org