

## Request for proposal: Arctic Challenge - Road transport automation and intelligent infrastructure

The Finnish Transport Agency and the Finnish Transport Safety Agency Trafi are requesting proposals for Arctic Challenge, a project examining opportunities in road transport automation and intelligent infrastructure and their performance in snowy and icy conditions. The functionality of the proposed solutions has to be verified through field studies carried out using automated vehicles. Arctic Challenge is part of the Aurora project.

The study and trials shall be carried out in Finland, on main road 21 in Fell Lapland, where the Finnish Transport Agency is installing technology on around nine kilometres of the main road 21 testing ground. This area is especially well-suited for testing intelligent transport and automated driving, as well as the supporting technologies, in road traffic (<http://www.liikennevirasto.fi/web/en/projects/all-projects/e8-kolari-kilpisjarvi#.WJluGxt96Uk>).

The Finnish Transport Agency and Trafi have reserved a total of 1-2 million euros for the Arctic Challenge project for 2017-2019. Moreover, the Finnish Transport Agency has reserved about 2 million euros for construction and maintenance of the intelligent infrastructure devices required in the Arctic Challenge project. As a general rule, the Finnish Transport Agency is responsible for all orders, subcontracts and costs incurred for building and installing the intelligent devices in the structures on the Aurora testing ground. The Contractor shall be responsible for financing any potential product development of their own in connection with the project.

The Finnish Transport Agency and Trafi have identified seven subjects of study regarding the challenges of automation and intelligent infrastructure in snowy and icy conditions, and Contractors are now requested to present their proposals. Arctic Challenge is based on the Road Transport Automation Road Map and Action Plan 2016–2020 (Finnish Transport Agency, 19eng/2016; [http://www2.liikennevirasto.fi/julkaisut/pdf8/lts\\_2016-19eng\\_road\\_transport\\_web.pdf](http://www2.liikennevirasto.fi/julkaisut/pdf8/lts_2016-19eng_road_transport_web.pdf)).

The following subjects will be studied in the Arctic Challenge project:

1. Road markings and traffic signs: How do weather and road surface conditions affect the different sensor types used for automatic road-marking and traffic-sign detection and recognition? (Finnish Transport Agency 19/2016, II.1.2)
2. Sensors and beacons embedded into road pavement: What techniques and sensors are suitable for snowy and icy conditions? How do visibility and lighting affect the performance, such as the accuracy, operability and reliability, of these techniques and sensors? (Finnish Transport Agency 19/2016, II.3.1)
3. Posts and poles for guidance and positioning: What landmarks, such as delineators and reflective posts, or snow poles and plot access marks, support automated driving? Where should these be located? What should they be like? (Finnish Transport Agency 19/2016, II.4.1)

4. Sensor technologies: How would sensor technologies used for slipperiness detection react to icy, snowy and slushy road surfaces at varying temperatures (-30...+3°C)? (Finnish Transport Agency 19/2016, III.9.1)
5. Hybrid communication: How could the C-ITS Day 1 hybrid services improving traffic flow and safety be implemented on the main road 21 and Highway E8 Aurora Borealis Corridor between Kolari, Finland and Tromsø, Norway, and what is their technical operability? What Day 1 services should be implemented in the Aurora Borealis Corridor? (Finnish Transport Agency 19/2016, III.16.1)
6. Hybrid communication and communications infrastructure: How does the remote control and monitoring of vehicles work in 4G and in the first stage of the 5G network in good/poor weather and road conditions? What minimum requirements should the communications network meet to enable remote control of automated vehicles?
7. Positioning of vehicle: In what way and how accurately could a vehicle be positioned to fulfil the needs of automated driving at northern latitudes where no edge markings or roads can be recognised? How can different methods be applied to special locations and situations, such as blind spots or glare? (Finnish Transport Agency 19/2016, III.13).

In addition to the above, the Contractors may propose other issues for examining road transport automation and intelligent infrastructure, as well as propose solutions to how their performance could be studied in arctic conditions.

The Arctic Challenge request for proposal was published on 19 January 2017. The initial proposal of the two-phase request for proposal shall be submitted by 15 March 2017. Additional information about the Arctic Challenge request for proposal can be found on the following websites, which include the official request for proposal in Finnish: [www.hankintailmoitukset.fi](http://www.hankintailmoitukset.fi) and [hanki.tarjouspalvelu.fi/](http://hanki.tarjouspalvelu.fi/)

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