

Executive Summary

The aim of the European Union's co-founded AutoNet2030 research project is to investigate the complementarity between on-board sensors and 5.9GHz 802.11p-based cooperative wireless communications, and demonstrate how these components can work optimally together in an advanced automated driving system.

AutoNet2030 intends to demonstrate how the combination of cooperative wireless communications and on-board sensors will make lane-keeping, manoeuvring negotiations and interaction between automated/manually driven vehicles more efficient and reliable. The prototyped cooperative automated driving system will be fully integrated into test vehicles and demonstrated on a test track. Using results from drive-testing measurements, the effect of scaling-up to dense traffic scenarios will be investigated through computer simulations. The project aims at actively contributing to the ongoing standardization of cooperative vehicular communications at the European Telecommunications Standards Institute's Intelligent Transportation Systems (ETSI ITS) unit. The project consortium goal is to contribute to the development and demonstration of fail-safe, yet cost-effective automated driving technology.

This document describes the development and implementation status of the novel accomplished control algorithm, the LDM as well as the communication protocol implementations. Furthermore, this considers the constraints imposed by the available vehicle platforms and hardware, the anticipated use cases as well as the algorithmic challenges. Based on these, design decisions are justified and particular implementations are proposed.

The results and work presented in this deliverable are understood as a basic technology study to test and verify different approaches implemented within the AutoNet2030 project. For the final system the most appropriate approach will be chosen and implemented in the AutoNet203 prototype. By that approach, the achievements done inside of AutoNet2030 can be easily reused and applied to similar use-cases and problems which are not directly covered by AutoNet2030 at the moment.