

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, progressing automated driving towards an inherently safe technology. 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 the integration of the AutoNet2030 prototype. Furthermore, details about the implementation of the HMI are given. After an overview of the available techniques in order to integrate legacy and new software modules into the AutoNet2030 prototype, the integration of each main component is explained in detail. This includes the motion planning & control, the perception including the LDM, as well as communication and HMI. The report finishes with a summary of the physical integration sessions conducted in Sweden, France and Italy. Moreover, the integration of the Webots simulation with the AutoNet2030 prototype for more complex scenario simulations is described. Finally, the evaluation strategy of the V2X message exchange, which is a crucial part in AutoNet2020, using the Vector CANoe.Car2x software is explained.