

SAFESPOT INTEGRATED PROJECT - IST-4-026963-IP

DELIVERABLE



SP5 – CoSSIB– Cooperative Safety Systems Infrastructure Based

Specifications for Intelligent Cooperative Intersection Safety

Deliverable No.	D5.3.3		
Subproject No.	SP5	Subproject Title	CoSSIB
Work Package No.	WP3	Work Package Title	Specifications
Task No.	T5.3.3	Task Title	IRIS
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EXECUTIVE SUMMARY

The CoSSIB sub-project (SP5) of the SAFESPOT Integrated Project aims to specify and develop a set of cooperative system applications based on the support of roadside equipment with infrastructure-based sensing and processing. The deliverable D5.3.3 is one of four other documentations on infrastructure-based applications designed for rural areas and motorways. D5.3.3 presents the specifications of the infrastructure-based application monitoring an urban intersection called "Intelligent Cooperative Intersection Safety System" (IRIS).

In order to achieve the objective of a safe urban intersection with significantly less accidents, it is necessary to detect critical situations as early as possible and to monitor the whole intersection with its approaches and exits. Information provided by approaching vehicles has to be fused with data obtained from roadside sensor systems and to be stored in the Local Dynamic Map (LDM). The LDM is a real-time or near real-time geometric representation of relevant infrastructure and non-infrastructure features and objects in the vicinity of the RSU. Based on the available data in the LDM, the application calculates the exact trajectories of the vehicles. Furthermore, an extrapolation of the trajectories is computed that can be regarded as a forecast of the road user movements. By analysing these trajectories critical situations can be identified and the alert systems actuated.

There are three sub-applications: 1. the basic version, 2. the application supporting emergency vehicles, and 3. the version monitoring an uncontrolled intersection. The focus is on the basic application which has the objective to identify potential red light violators, to support the drivers turning right in being aware of pedestrians and cyclists as well as to assist unprotected left turning vehicles without a separate green light.

The deliverable contains a brief overview of the SAFESPOT system and how the intersection applications fit into the framework. Based on this explanation the components of IRIS and the messages between these components are described in a sequence diagram. Furthermore, the required data input and the message output of the applications are defined. The concept of the applications itself is explained in detail.

In addition, the behaviour of the system in case of a possible breakdown of core components is mentioned and first ideas on Human Machine Interface (HMI) issues and necessary driving simulator tests are presented. The tracking of the WP2 requirements concerning the application is explained in order to avoid departing from the previously derived focus of the application.

Besides the work done in WP2, this deliverable is another important step in setting up an infrastructure-based intelligent intersection system.

NOTE on Deliverable Renaming:

The decision to rename the deliverables was approved both at SP and IP level but not yet reported in the technical annex of the 2nd amendment. The reason was an organizational improved distribution of the arguments in the different deliverables and titles better describing the contents.

Hence “Smart signaling for safety enhancement” does not describe the application in accordance with the principles of V2I communication of the SAFESPOT project it was decided to suppress it. On the other hand the application “Speed Alert” and “Road Departure Prevention” are two different applications, which have to be described in two separated deliverable.

In D5.3.3 there was no change in the content of the deliverable, but only an exchange for the name of the application. The reason for this renaming is that the former application name CICPS was not easy to pronounce and very similar to the U.S. equivalent application on intersection safety. The second reason is that the new name IRIS refers to the eye. In this case the bird’s eye indicating the perspective from which the IRIS system is operating.

Intelligent CoopeRative Intersection Safety - System - the IRIS-System

The application name is also mentioned in the deliverable name.

This is the reference table for the deliverable renaming:

Deliverable Number	Old Name	New Name	Changed
D5.3.1	Specifications for Smart signalling for safety enhancement	Specifications for Speed Alert	YES
D5.3.2	Specifications for Hazard and incident signalling	Specifications for Hazard and incident Warning	YES
D5.3.3	Specifications for Safe urban intersection	Specifications for Intelligent Cooperative Intersection Safety	YES
D5.3.4	Specifications for Speed alert and road departure prevention	Specifications for the Road Departure Application	YES
D5.3.5	Specifications for Safety Margin for Assistance and Emergency Vehicles	Specifications for Safety Margin for Assistance and Emergency Vehicles	NO

Table 1: Deliverable Reference Table