

Regulation Study for Interoperability in the
Adoption of Autonomous Driving in European
Urban Nodes

AUTOCITS

Lisbon Pilot Assessment and Results

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Lisbon, February 28th, 6th Open Workshop

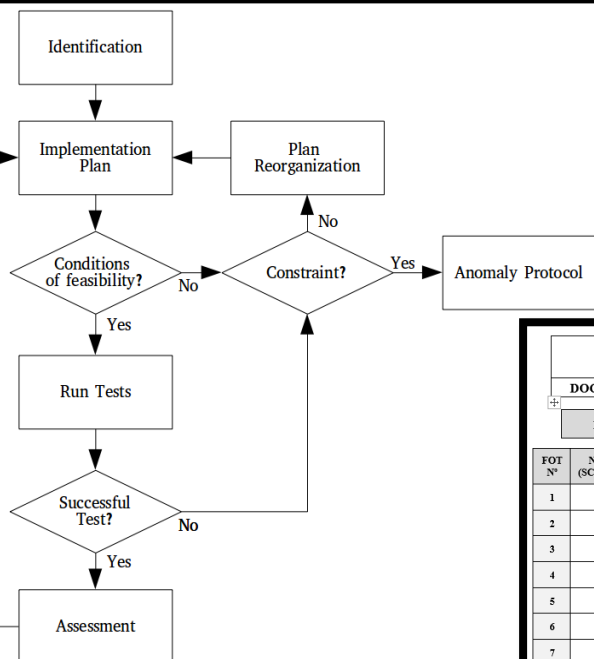


**AUTO
C-ITS**

ACTIVITY 4

1. Assessment Methodology
2. Lisbon Pilot Scenarios
3. Interoperability Evaluation
4. Vehicles' Behaviour Evaluation
5. Lisbon Pilot Results: Toll Passing
6. Conclusion

Procedure



Methodology

Procedure and Forms

Key Performance Indicators

Objectives

Assessment of use case tests

Use case Tests Evaluation

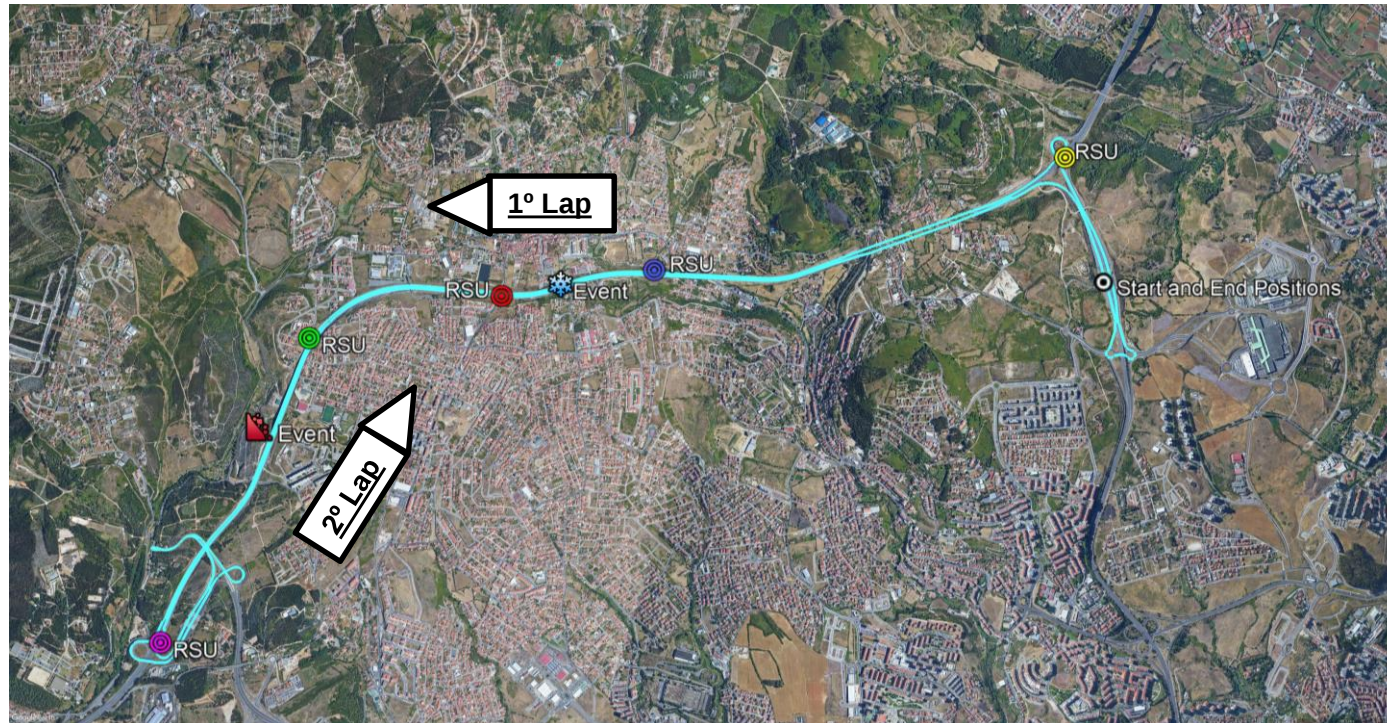
Forms

INITIAL TEST KPIs ASSESSMENT										
DOCUMENT N°4		[CITY] INITIAL TESTS EVENT								
DATE		FOT ENGINEER								
FOT N°	N° TEST (SCENARIO)	BROADCASTED DENM TIMESTAMP	RECEIVED DENM TIMESTAMP	EVENT (TIMESTAMP/ LOCATION)	KPI 1	KPI 2	KPI 3	PASS [Y/N]		
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

KPI's

N°	KPIs	Unit	Required Measures	Description	Objective
1	Start and End of DENM broadcasting (SEDMB)	0 or 1	Timestamp of messages broadcasted by the infrastructure.	Check the broadcasting of DEN messages by the infrastructure during all test.	Assess the infrastructure performance ensuring the transmission of messages.
2	Start of receiving of the expected DENM (SREDM)	0 or 1	Timestamp of messages transmission of the CV	Check the receiving of DEN messages by CV along the test.	Assess the OBU performance on the connection with RSUs, mainly according the receiving of messages broadcasted by CITS Platform.
3	Suitable timestamp of receiving of a DEN message (STRDM)	0 or 1	Timestamp of messages transmission of the CV; Vehicle GPS position	Check whether the Timestamp of a hazardous event in the DENM content is less than the timestamp of the first DENM received.	Assess the communication technology performance on transmission of DENM messages.

Lisbon Pilot Scenarios



Bosch CV



CTAG CAV



UPM CAV



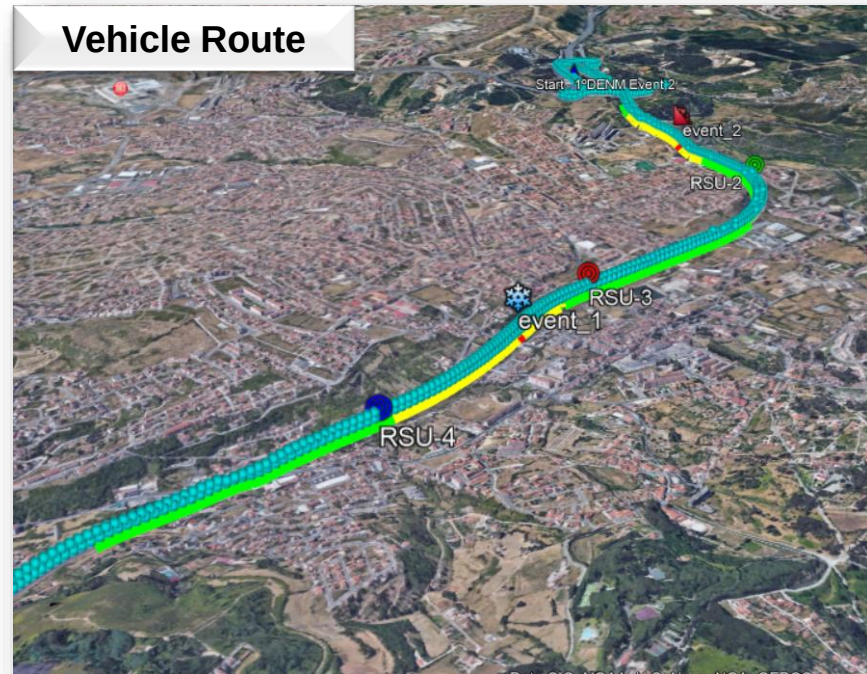
Lisbon Pilot Scenarios

Scenario

Dedicated Lane

Shared Lane

Vehicle Route



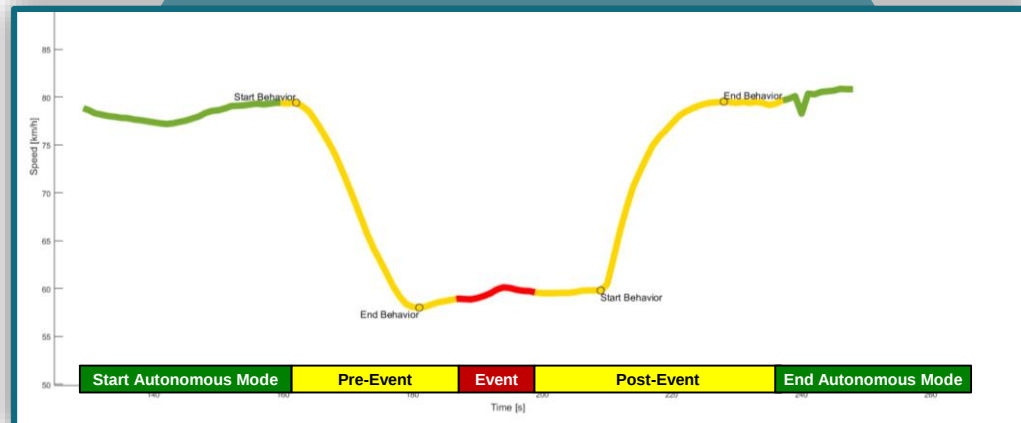
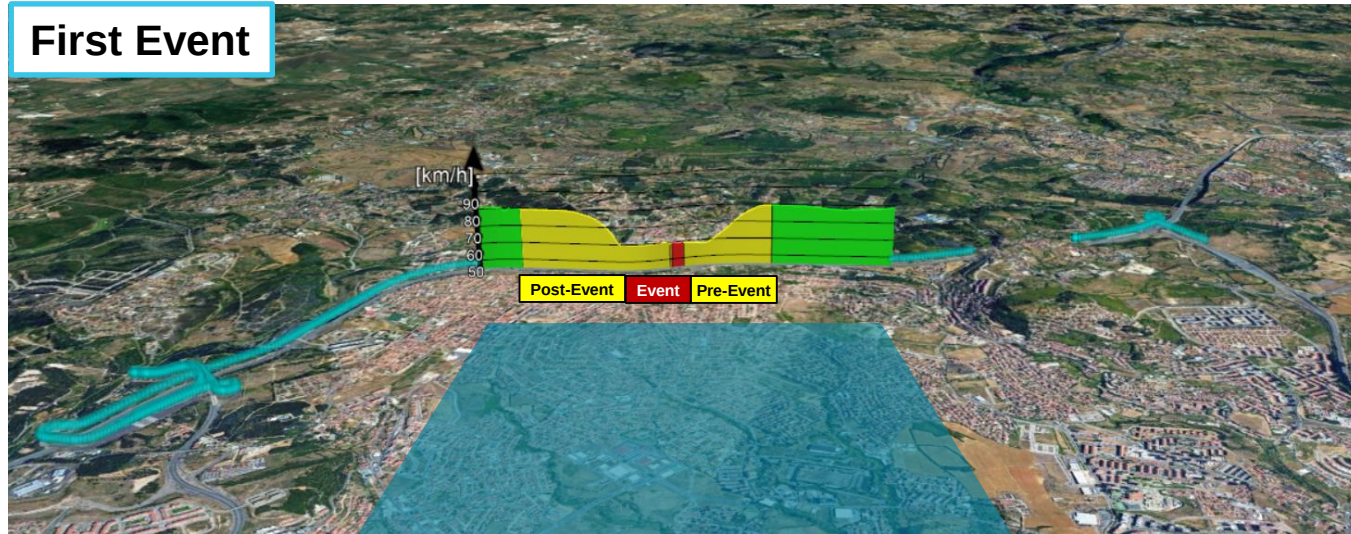
Event	Lap
Ice on the Road	1 ^o Lap
Rock Falls	2 ^o Lap
Heavy Rain	1 ^o Lap
Accident	2 ^o Lap

Interoperability Evaluation

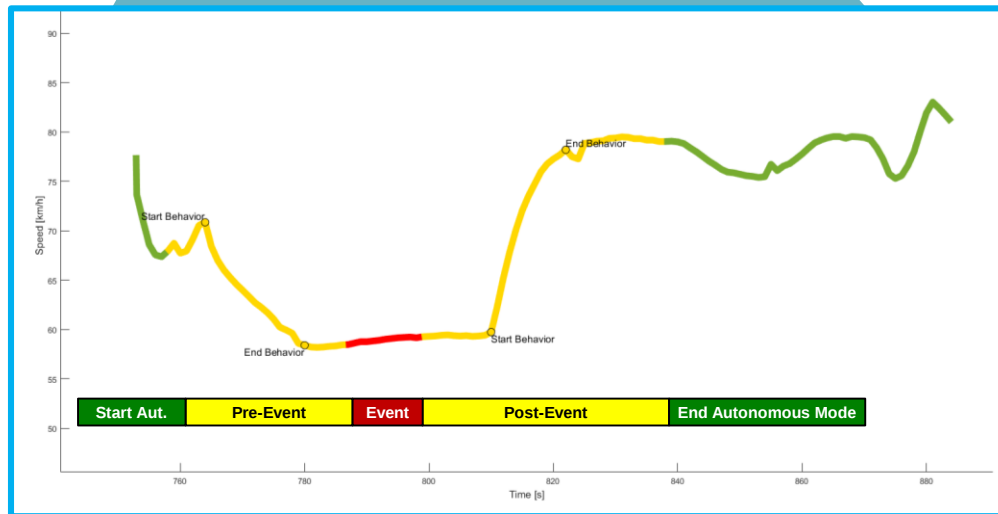
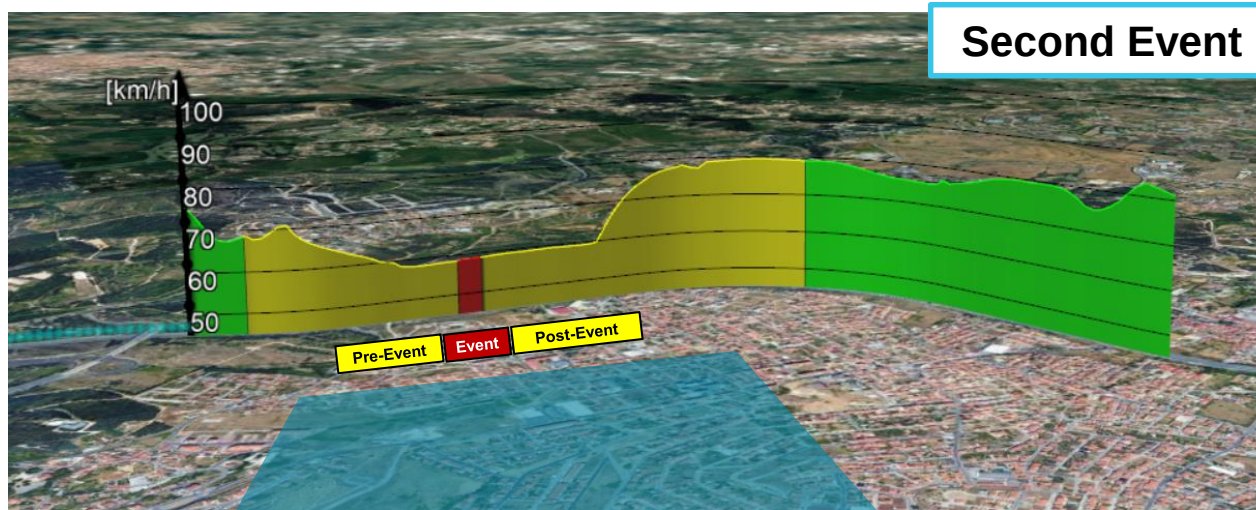


Vehicles' Behaviour: Speed Values

First Event



Vehicles' Behaviour: Speed Values



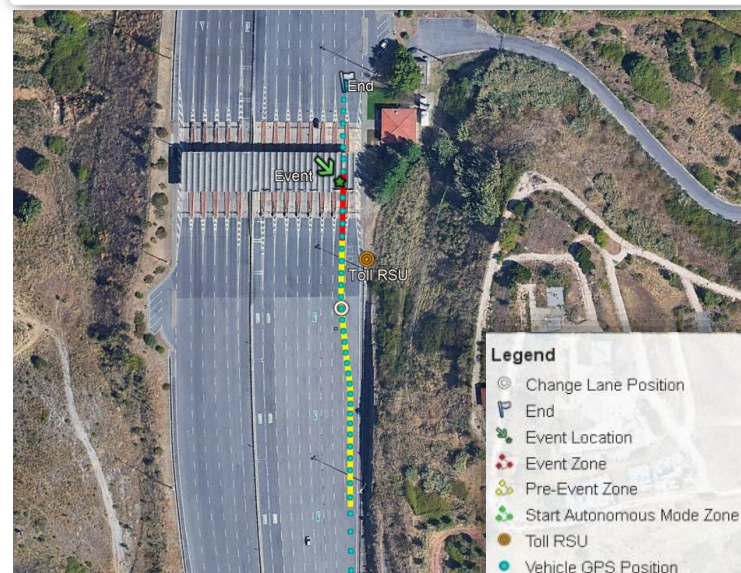
Lisbon Pilot Results: Toll Passing



Interoperability



Vehicle Behaviour



- Satisfactory results related to the interoperability;
- All vehicles have performed, in terms of behaviour changes, as expected;
- Both speed reduction and lane change (which are evidences of behaviour change) have been performed in the event zones as planned;
- Overall good performance of all participating teams.



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