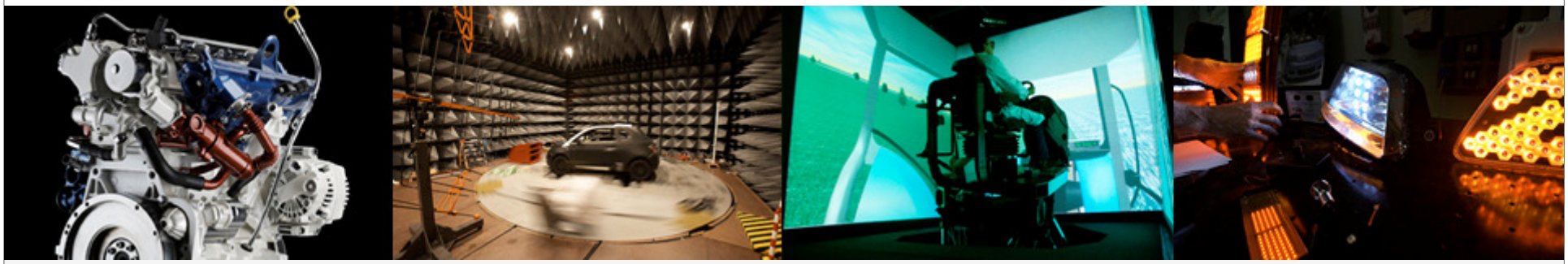
FIAT GROUP

CRF CENTRO RICERCHE FIAT



# WP4 – SeVeCom

**SeVeCom, SAFESPOT → USE CASES**

**Cosenza Stefano**

# SAFESPOT: Italian Test Site

- **Application V2V**
- Head on collision warning
- Speed limitation and safety distance
- Safe overtaking
- Lane Change Manoeuvre
- Rear end collision

- **Application V2I**
- Curve warning
- Road departure
- Mobile RSU
- Hazard & Incident warning
- WSN (incident & vehicle detection)
- RFID (vehicle detection)
- Synergies with CVIS

- **SELECTED LOCATIONS**
- FIAT test track
- 2 Motorway
- Suitable Rural road
- Urban road – synergies with CVIS

- **CRF Test track**
- Curve warning
- Road departure
- Head on collision warning

- **Torino Caselle**
- Speed limitation and safety distance
- Safe overtaking
- Lane Change Manoeuvre
- Mobile RSU
- Hazard & Incident warning
- WSN (incident & vehicle detection)
- RFID (vehicle detection)

- **Brescia Padova**
- Speed limitation and safety distance
- Safe overtaking
- Lane Change Manoeuvre
- Urban road intersection
- Mobile RSU
- Hazard & Incident warning

- **Suitable rural road**
- Rear end collision

- **Urban road intersection**
- Synergies with CVIS

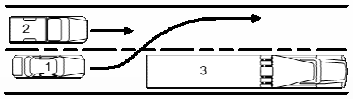
# SAFESPOT: Netherland Test Site

- **Application V2V**
- Safe overtaking
- Road condition status

- **Application V2I**
- basic application
- critical speed warning static/legal
- critical speed warning dynamic
- static obstacles
- reduced visibility
- Assistance vehicles signalling

- **SELECTED LOCATIONS**
- Motorway _A16 Rotterdam-Antwerp
- Rural road _N629
- Urban intersection_Helmond

1



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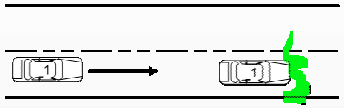

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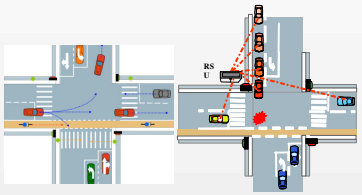

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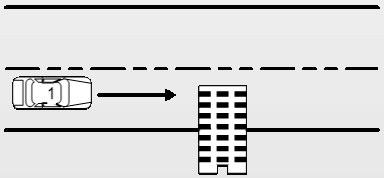

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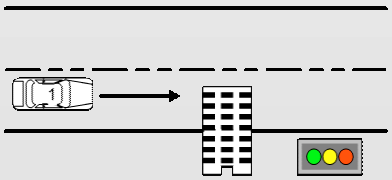

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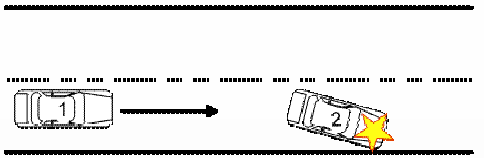

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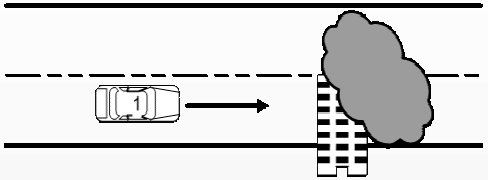

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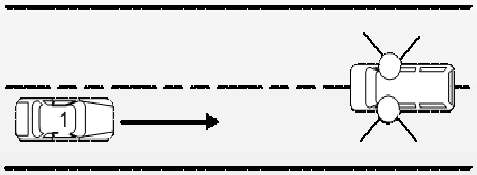


# SAFESPOT: West Test site (France &Spain)

- **Application V2V**
- Road intersection safety
- Vulnerable road user detection and accident avoidance

- **Application V2I**
- Static obstacles
- Critical speed warning (legal)
- Critical speed warning (dynamic)
- Safety margin for assistance vehicle signalling a critical event
- Road departure warning

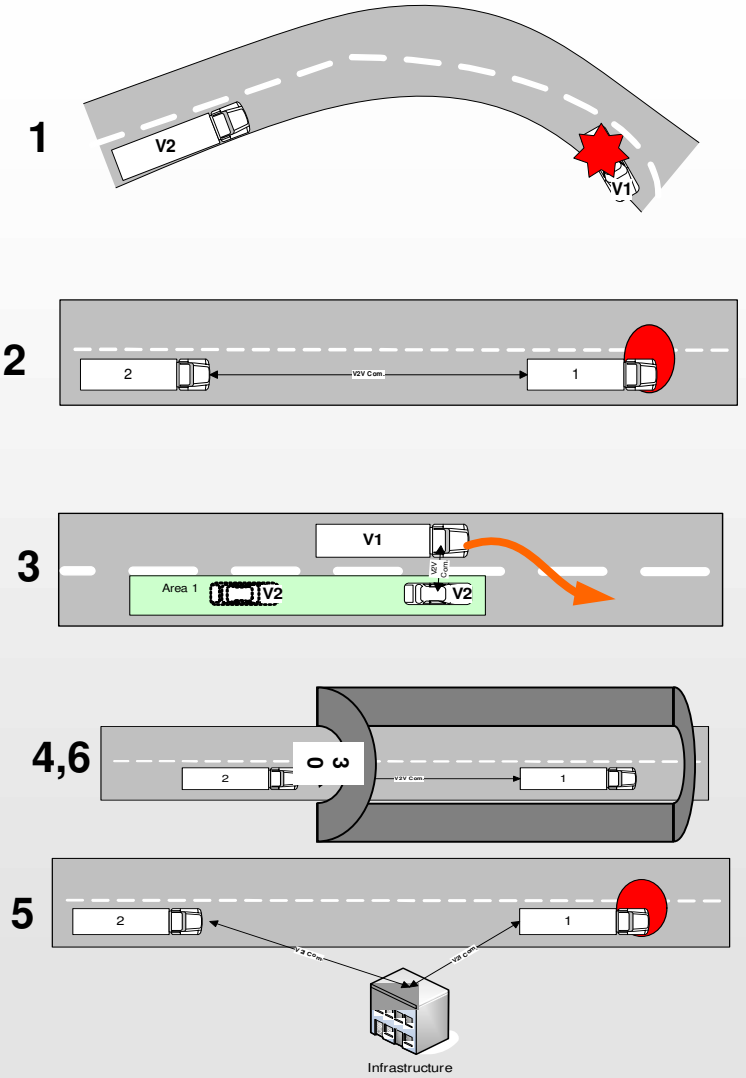
- **SELECTED LOCATIONS**
- Rural road
- Closed track
- National road N 122
- Motorway A10 or A11
- Rural road (SARI site)

# SAFESPOT: Sweden Test site

- **Application V2V**
- Frontal collision warnings
- Road Condition Status
- Lane Change Manoeuvre
- Speed Limitation and Safety Distance

- **Application V2I**
- Road Condition Status
- Speed Limitation and Safety Distance

- **SELECTED LOCATIONS**
- Road tunnels (Lundby Tunnel)
- Closed Test Track Storaholm
- Road/Highway-E6 Highway//RV 45
- Lindholmen Science Park

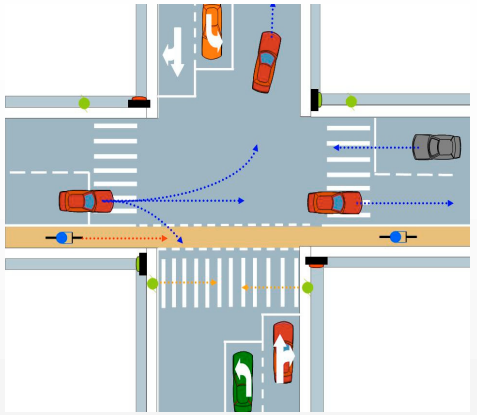


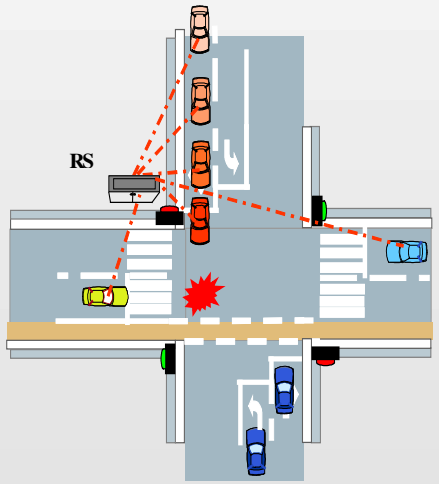
# SAFESPOT: German Test site

- **Application V2V**
- std. (maybe some from SP4)

- **Application V2I**
- Co-operative Intersection Collision Prevention System basic application
- Hazard warning (road conditions, accidents, traffic jams, obstacles)
- Critical speed warning static/dynamic
- Dynamic Black Spots and “Safety Server”

- **SELECTED LOCATIONS**
- Urban roads (downtown Dortmund)
- One or two complex intersections
- Synergies with CVIS

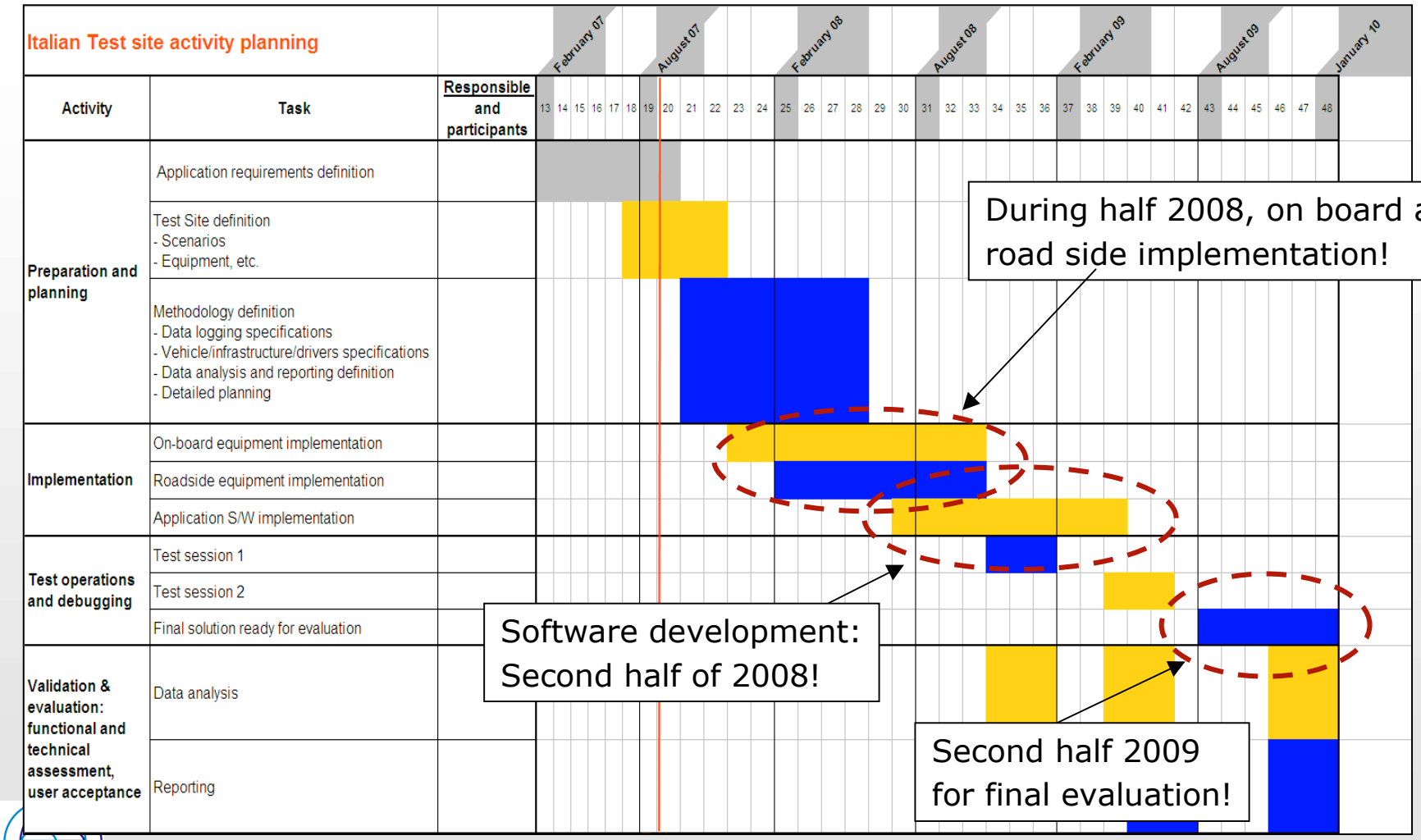




## SAFESPOT: Italian test site → vehicle&equipment

| VEHICLE/ OWNER | VEHICLE TYPE | APPLICATIONS | EQUIPMENT |
|---|---|---|---|
| CRF CAR 1 | FIAT BRAVO | All the selected applications presented | SP1-SP4 on board unit |
| CRF CAR 2 | FIAT BRAVO | All the selected applications presented | SP1-SP4 on board unit |
| CRF VEHICLE | TRUCK OR CAR shared with CVIS | All the selected applications presented | Subset of SF functionalities.<br>At least communication module |
| PIAGGIO | MOTORBIKE 1 | Safe overtaking, lane change manouvre | To be defined<br>Subset of SP4 on board unit |
| PIAGGIO | MOTORBIKE 2 | Safe overtaking, lane change manouvre | To be defined<br>Subset of SP4 on board unit |
| ANAS // BSPD | ASSISTANCE VEHICLE | Mobile RSU | Subset of RSU |

# SAFESPOT: Italian test site → Activity Planning



WP4

*Objectives :*

To build up a security lab setup for early implementing and testing of VANET security mechanisms

To integrate SEVECOM development into use cases implementations which are based on the V2V/V2Iinfrastructure used by eSafety projects. While two types of use cases are considered, one on **traffic safety** and one on **traffic efficiency**, most of the resources will be dedicated to traffic safety.

**SAFESPOT Use Cases:**

**Pro**

- **Several conditions taken into account;**
- **Wide variety of interactions (V2V and V2I);**
- **Several type of vehicles involved;**
- **Several test site available.**

**Cons**

- **Timing compatibility with SeVeCom about: development, testing, validation;**
- **Availability of the systems for development, debug and testing;**
- **Accessibility to test site and vehicles;**
- **SAFESPOT selected platform cannot be modified for SeVeCom use.**

In alternative…

Possible SAFETY applications

The traffic efficiency application could be chosen among the following (in collaboration with DC.)

- Determine and distribute network optimum traffic flow setting;
- Communicate network optimum traffic flow settings to road users;
- Cooperative acceleration and deceleration;
- Communicate expected service at intersection and speed advice;
- Cooperative platooning.

?

SeVeCom clustered applications

- SOS services
- Stolen vehicles tracking
- Map download/update
- **Intersection collision warning**
- Vehicle-based road condition warning
- Electronic license plate
- Road surface conditions to TOC
- Software update/flashing
- Emergency vehicle signal pre-emption
- **Work zone warning**

CENTRO RICERCHE FIAT

## Another possibility…

To create 2 "sub use cases" starting from SAFESPOT use cases (SP4):

**Pro**

- Avalability of the systems during all the different phases;
- Less timing problems;
- Specific focus on the security and on the different types of attack.

**Cons**

- The security mechanisms could not be interoperable with SAFESPOT applications;
- The use cases cannot be fully representative of a SAFETY/ TRAFFIC EFFICIENTY use case;
- Stand alone security system.

| Vehicle/Owner | Type of vehicle | Application | Equipment | Attack to simulate |
|---|---|---|---|---|
| | | | | |
| | | | | |

In this case, it would be necessary to detail 2 sub use cases to develop, test and validate the security mechanisms (mainly):

The (indicative) process would be:

- list of possible use cases;
  - Input from SAFESPOT/CVIS
- definition of the scenarios;
  - Input from SAFESPOT/CVIS
- definition of the involved vehicles;
- definition of the necessary equipment (HW & SW);
- definition of the attack to simulate;
  - definition of the equipment necessary to set up the attacks;
- definition of the messages to exchange;
  - Input from SAFESPOT
- …

SAFESPOT specifications will be taken into account as input during every phase.

**Point to start:**

**Definition of SeVeCom platform → at the moment not defined yet**