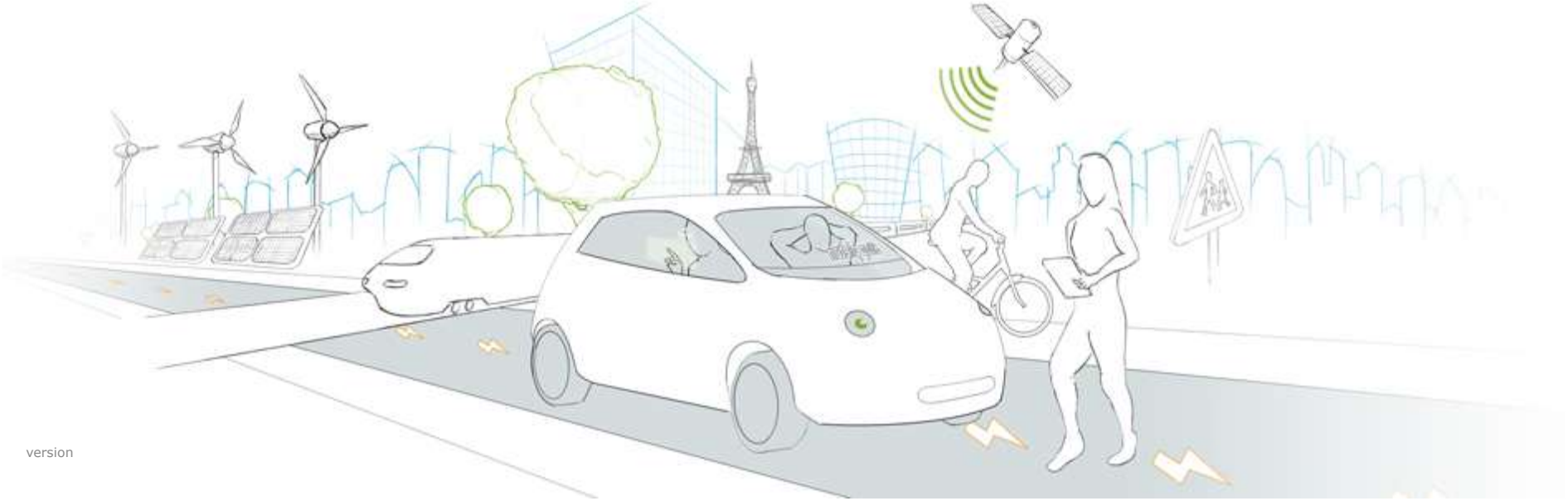
INTRODUCTION

Workshop : Autonomous Systems

Gilles LE CALVEZ – Vehicle Program Director



version

AGENDA OF THE WORKSHOP

- **14h – 14 h 30 : Introduction (G. Le Calvez, VEDECOM)**
- **14 h 30 – 15 h : Validation robuste des véhicules autonomes par simulation numérique (E. Landel, RENAULT)**
- **15 h – 15 h 30 : La Vision d'un équipementier automobile pour développement et validation de véhicules autonomes (S. Ahiad, VALEO)**
- **15 h 30 – 16 h : PAUSE / VISITE EXPOSITION / NETWORKING**
- **16 h – 16 h 30 : Comment la simulation peut-elle améliorer l'IA dans l'industrie de la défense navale (D. Laval, NAVAL GROUP)**
- **16 h 30 – 17 h : La vision du techno-provider sur les outils pour traiter le volume important de données (L. Castignani, MSC SOFTWARE)**
- **17 h – 17 h 30 : Table ronde / Echange avec les participants**

VEDECOM – OBJECTIVES AND MISSION

VEDECOM, Institute for Energy Transition, created in 2014,

Dedicated to sustainable mobility :

- **More autonomous Mobility**
- **More environmental friendly Mobility**
- **More shared Mobility (inclusive, affordable …)**

Yearly Budget : 30 Millions Euros

Approx. 200 people dedicated to this mission :

56 Members :

- **Automotive** sector
- **Aeronautics** sector
- **Road infrastructure** sector
- **Telecom** sector
- **Transportation service** sector
- **Information Systems** sector

3 Challenges

Vehicle electrification

To contribute to air quality improvement in urban areas and CO2 massive reduction

By **moving** Electric Vehicle from niche to **mass market**

Driving delegation and connectivity

To offer sustainable, safe and efficient mobility

By **accelerating the introduction of automated cars**, with or without driver

Shared mobility and energy

To optimize mobility systems on territories

By **analysing** and **experimenting new services** linked with green, autonomous and connected vehicles

INSTITUT VEDECOM

AUTONOMOUS VEHICLE … AUTONOMOUS SYSTEMS !

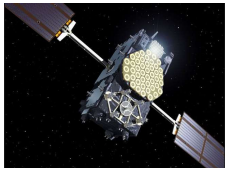
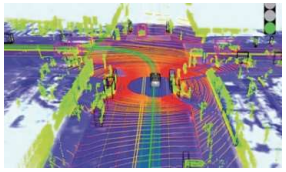
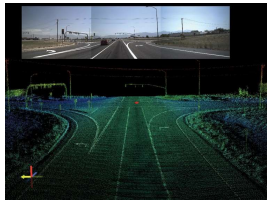
Various domains → Various Requirements … Anything common ?

INSTITUT VEDECOM

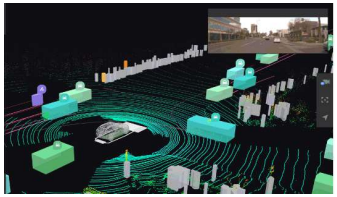
COMMON TOPICS OF INTEREST : TECHNOLOGY …

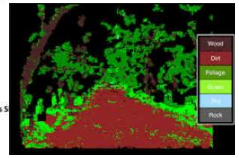
FUNCTIONS AND TECHNOLOGY

- **Localization**

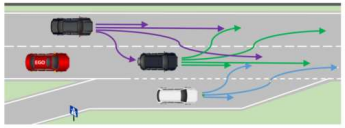




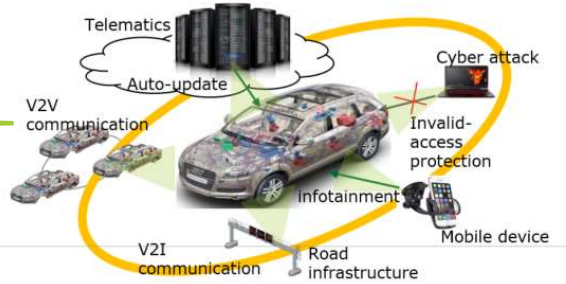
- **Perception / Data Fusion**



- **Prediction of Intention / Decision / Path Planning**





Connectivity

TECHNOLOGY is KEY, BUT SOCIETAL ACCEPTANCE is a LOCK : SAFETY ! DEVELOPMENT and VALIDATION

ONE EXAMPLE : SAFETY CRITICAL SCENARIOS : EVALUATING / COMPARING / VALIDATING

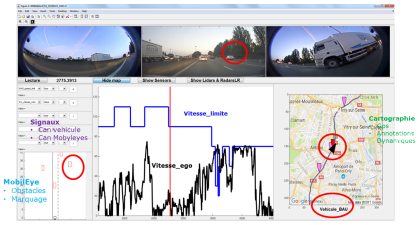
1. Big data : Specific Data Collect (6 equipped cars, with Lidars, radars, smart camersa,…) :
> 900.000 km
12000 h / 250To

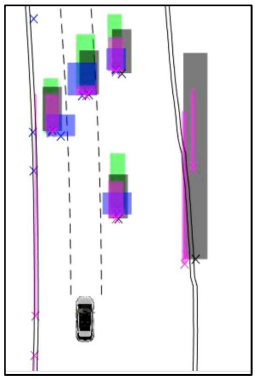
2.Preprocessing : Data Transformation **at common format**

3. Perception algorithms for identification of mobile and static objects and infrastructure

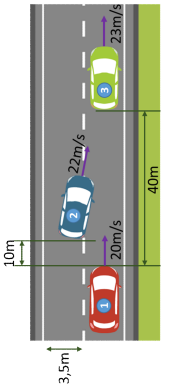
4. Computation of High Level Parameters (HLP) AV's environnement Modeling

5. Scenario exploration: safety event, variability (HLP) and Statistics



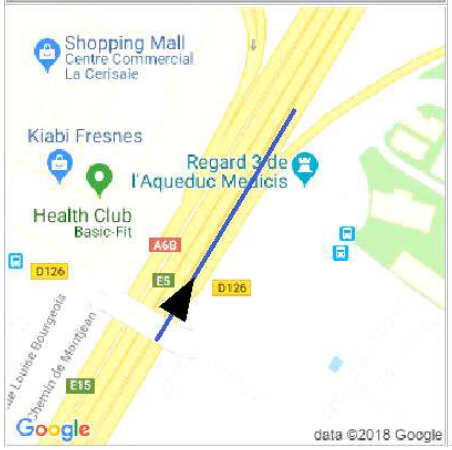


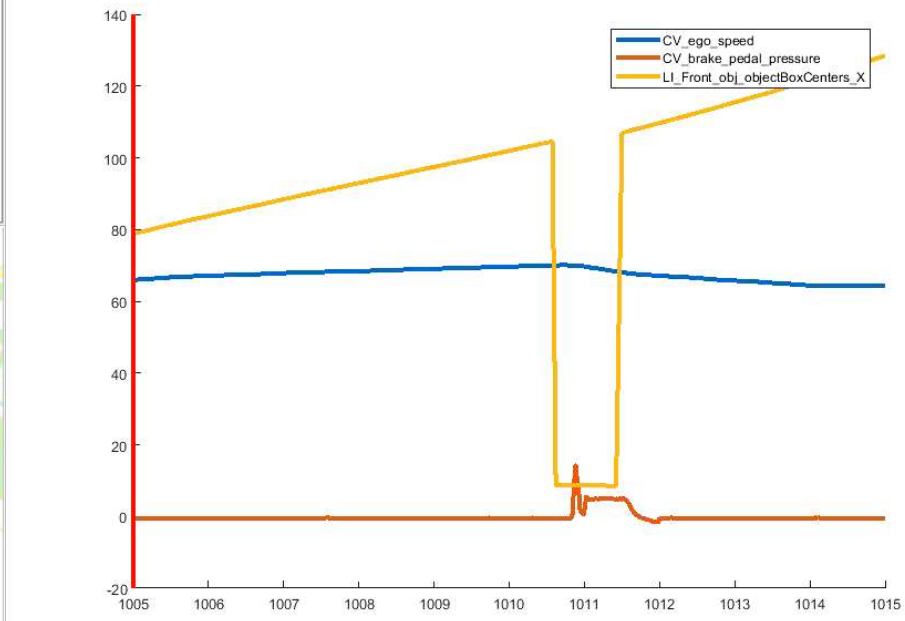
High Level Parameters
HLP_OriginalMultiplexor
HLP_UniqueID
HLP_AgeMax
HLP_AbsoluteSpeed
HLP_LaneShift
HLP_LengthCorrection
HLP_MobileObjectClassification
HLP_FixedObjectClassification
HLP_TimeBetweenVehicles
HLP_TimeToCollision
…

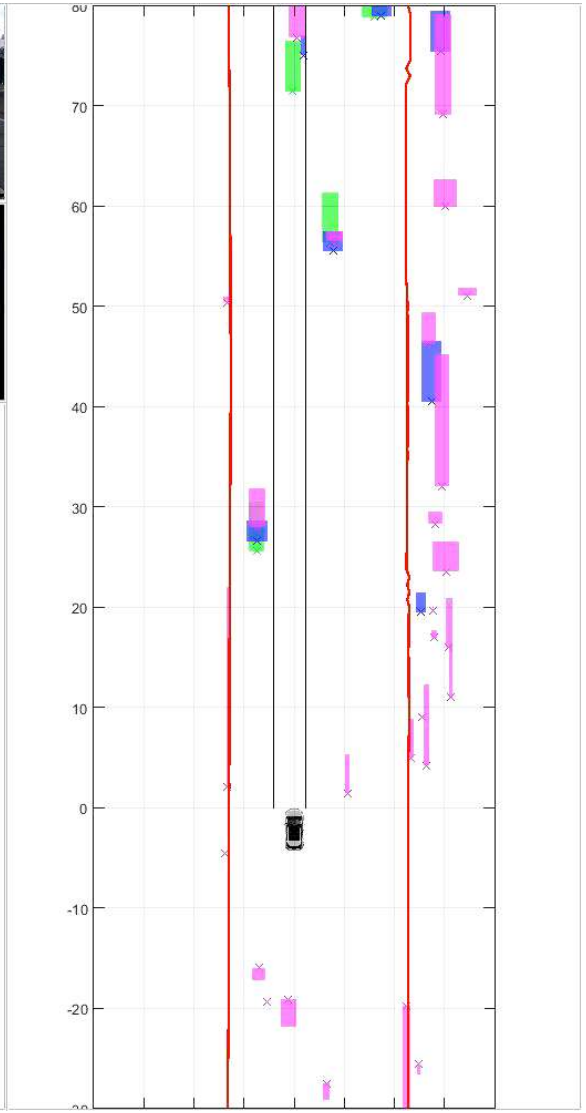


LET'S SEE A CONCRETE EXAMPLE …

Signal	Value
CV_ego_speed	
CV_brake_pedal_pressure	
LI_Front_obj_objectBoxCent...	







VALIDATION REQUIRES HUGE EFFORTS … THAT MUST BE SHARED …

MOOVE

SVA

SystemX
INSTITUTE OF RESEARCH AND TECHNOLOGY

PEGASUS

HEADSTART

HORIZON 2020

SAM

Let’s share the view from various staholders on Development, Validation & Simulation

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DU VÉHICULE DÉCARBONÉ ET COMMUNICANT ET DE SA MOBILITÉ

Thank you for your attention

Together to accelerate the mobility of tomorrow!