Pilot Site Center East

APRR - Benoît Vuadelle - CCAM expert

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Pilot Site « Center East »

The Eiffage motorway concessions in France

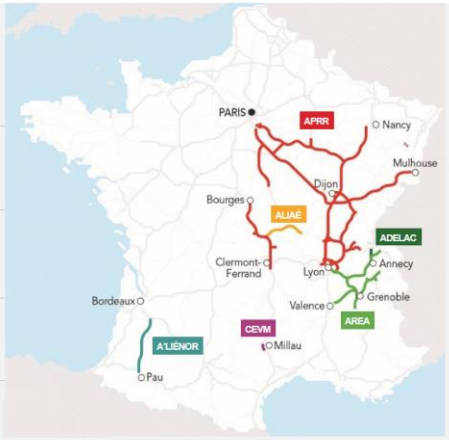
2 600 km TOTAL NETWORK

30 % FRENCH CONTRACTED NETWORK

3,2 Md€ TURNOVER

3 300 EMPLOYEES

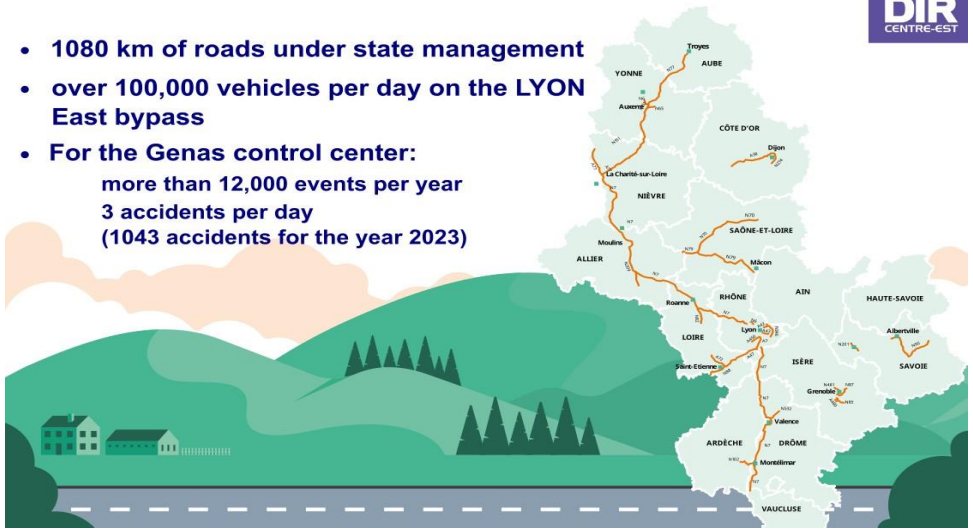
325 M CUSTOMER TRANSACTIONS



APRR	November 2035
AREA	September 2036
ADELAC	December 2060
A'LIÉNOR	December 2066
ALIAÉ	February 2068
CEVM	December 2079

DIR CENTRE-EST

- 1080 km of roads under state management
- over 100,000 vehicles per day on the LYON East bypass
- For the Genas control center:
  - more than 12,000 events per year
  - 3 accidents per day
  - (1043 accidents for the year 2023)



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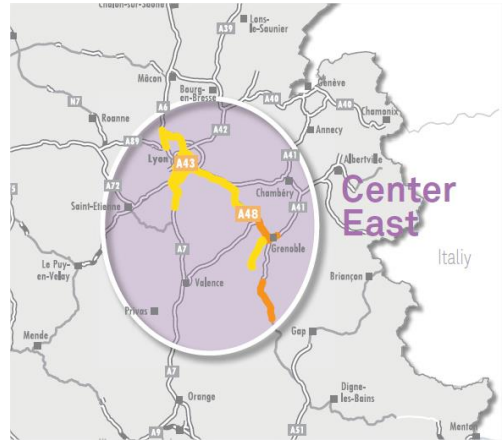
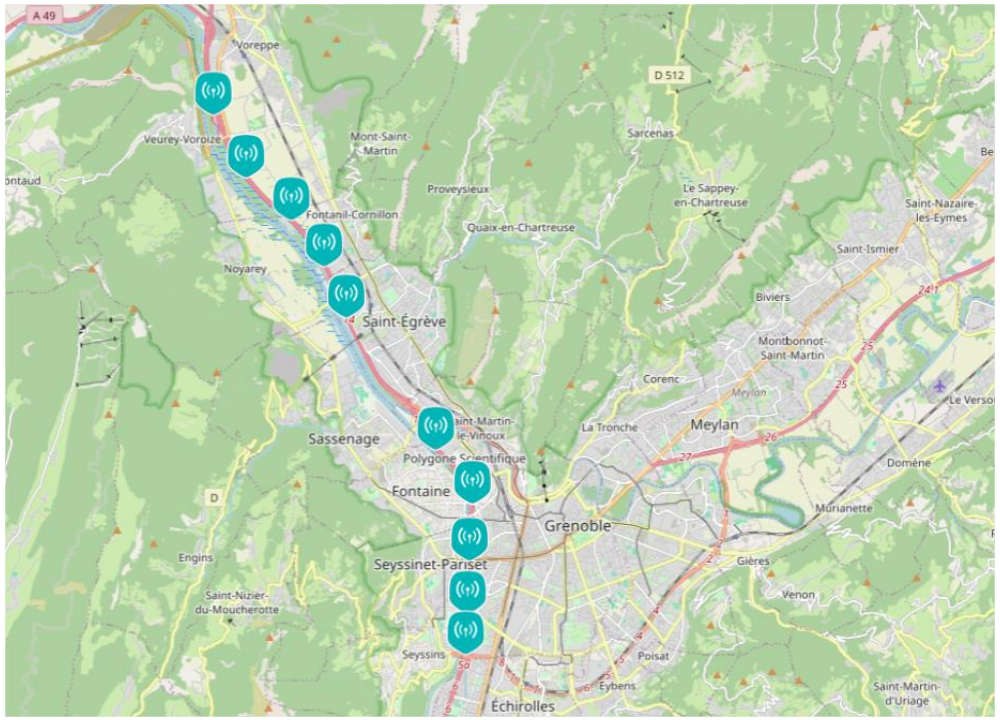
Pilot Site « Center East » location





- Equipment from C-ROADS et InDiD projects
  - 33 UBR over 97km
  - 6 prototype vehicles, snowplough / intervention vans

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Pilot Site « Center East » location

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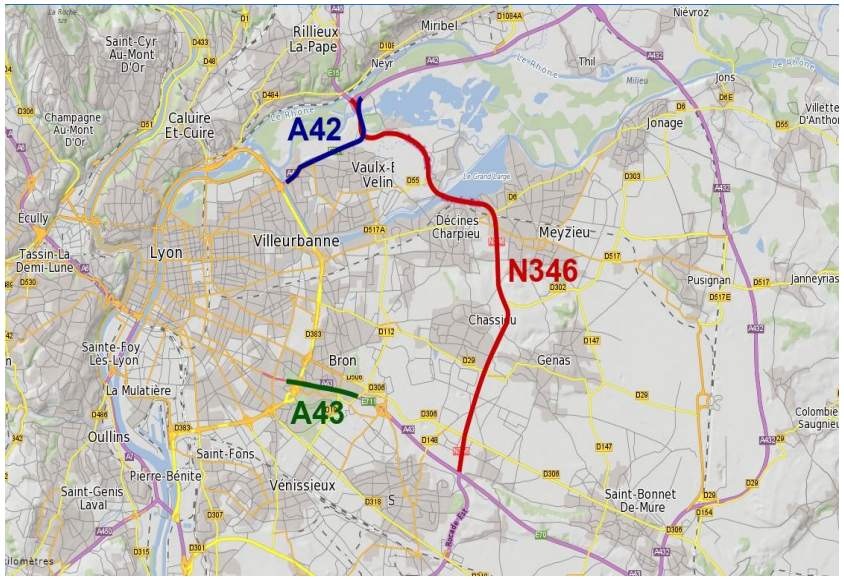
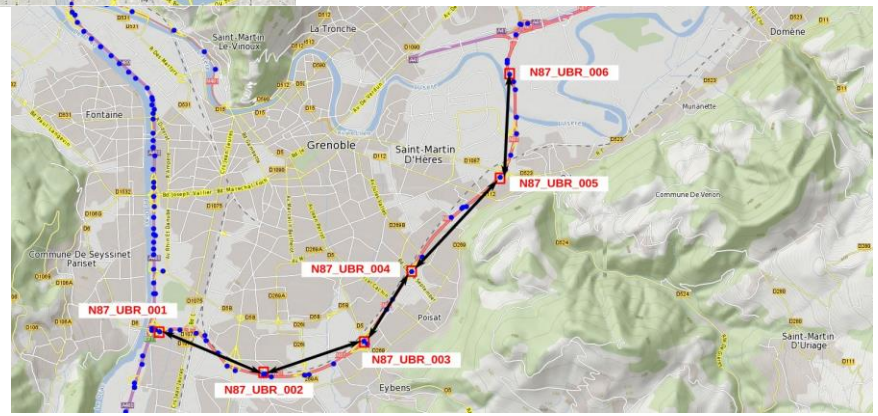
DIR CENTRE-EST

GRENOBLE area



LYON area



- Equipment from C-ROADS project
  - 22 RSU
    - 9 in Grenoble area (N481, N87)
    - 13 in Lyon area (A42, A43, N346)
  - 2 OBU kits on DIR vehicles

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Motivations

Challenges and objectives for the DIRCE

Improve the exchange of road information with road users

- For enhanced and high-quality road information:
  - The information is validated by the DIR, which informs users on the traffic conditions, road hazards, etc…
  - across the entire road network
- Facilitate multi-modality especially on peri-urban areas

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Services delivered primarily

To inform and make the road safer:

- **Roadworks alerts** (fixed/mobile)
- **Road operator vehicle alerts** (patrolling/intervening...)
- **Unforeseen** and **hazardous events** (animal/pedestrian/obstacle on the road; accident; broken down vehicle etc.)
- **Traffic information** and **rerouting** (alert for exceptional weather conditions, traffic jams...)

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Use Cases

DIRCE - Use Cases implemented

		Developed		
In-Vehicle Signage	Traffic Management / In-Vehicle Signage Traffic Signs (IVS – TS)	/		
	IVS -Embedded VMS "Free Text" (IVS-EVFT)	C3		
	In-vehicle dynamic speed limit information (IVS - DSLI)	C2		
	Toll station approaching: orientation of drivers	C4		
	Toll Barrier Crossing for automated vehicles	C8		
Hazardous Location Notification	Hazardous Location Notification Accident Zone (HLN – AZ)	D5		
	Traffic Jam Ahead (HLN – TJA)	E7		
	Stationary vehicle (HLN – SV)	D4a+b		
	Weather Condition Warning (HLN – WCW)	D6-E6		
	Temporarily slippery road (HLN – TSR)	D1		
	Animal or person on the road (HLN – APR)	D2		
	Obstacle on the road (HLN – OR)	D3		
	Emergency or Rescue/ Recovery Vehicle in Intervention (HLN – ERVI)	L2		ITS-G5 & Hybid
	Emergency or Prioritised Vehicle Approaching (HLN –EPVA)	D12		
	Railway Level Crossing (HLN – RLX)	K1-K3		
	Unsecured Blockage of a Road (HLN – UBR)	D8		
	Alert Emergency Brake Light (V2V)	D10		
	Alert end of queue	D11		
	Emergency vehicle approaching	D12		
	Alert Slow Vehicle (HLN - SLV)	D14		
	Alert Wrong Way Driving (HLN – AWWD)	D7		
	Public Transport Vehicle Crossing (HLN – PTVC)	/		
	Public Transport Vehicle at a Stop (HLN – PTVS)	I5		
	Alert temporary mountain pass route closure	D9a		
	Alert approaching a closed mountain pass route	D9b		
Road Works Warning	Road Works Warning Lane Closure (RWW – LC)	B1a		
	Road Closure (RWW – RC)	B1b		
	RWW -Road Operator Vehicle Approaching (RWW-ROVA)	B2a		
	RWW -Road Operator Vehicle in Intervention (RWW-ROVI)	B2b		
	Alert operator vehicle in patrol	B2c		
	Alert end of queue by a road operator vehicle	B2d		
	Road Works – Mobile (RWW – RM)	B1c		
	Winter Maintenance (RWW – WM)	B3		
	Dangerous vehicle approaching a road works: warning to the dangerous vehicle	B4/C11		
	Dangerous vehicle approaching a road works: warning to workers	B5		
Signalised Intersections	Signalised Intersections Signal Phase and Timing Information (SI – SPTI)	G1b		
	Green Light Optimal Speed Advisory (SI – GLOSA)	G1a		
	Imminent Signal Violation Warning (SI – ISVW)	G3		
	Traffic Light Prioritisation (SI – TLP)	G2		
	Emergency Vehicle Priority (SI – EVP)	G2		
	In-vehicle signage at a merge for vehicles on the entry slip road	G5		
	In-vehicle signage at a merge for vehicles on the main road	G6		
	HD cartography extended services	G7		

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C-ITS Architecture

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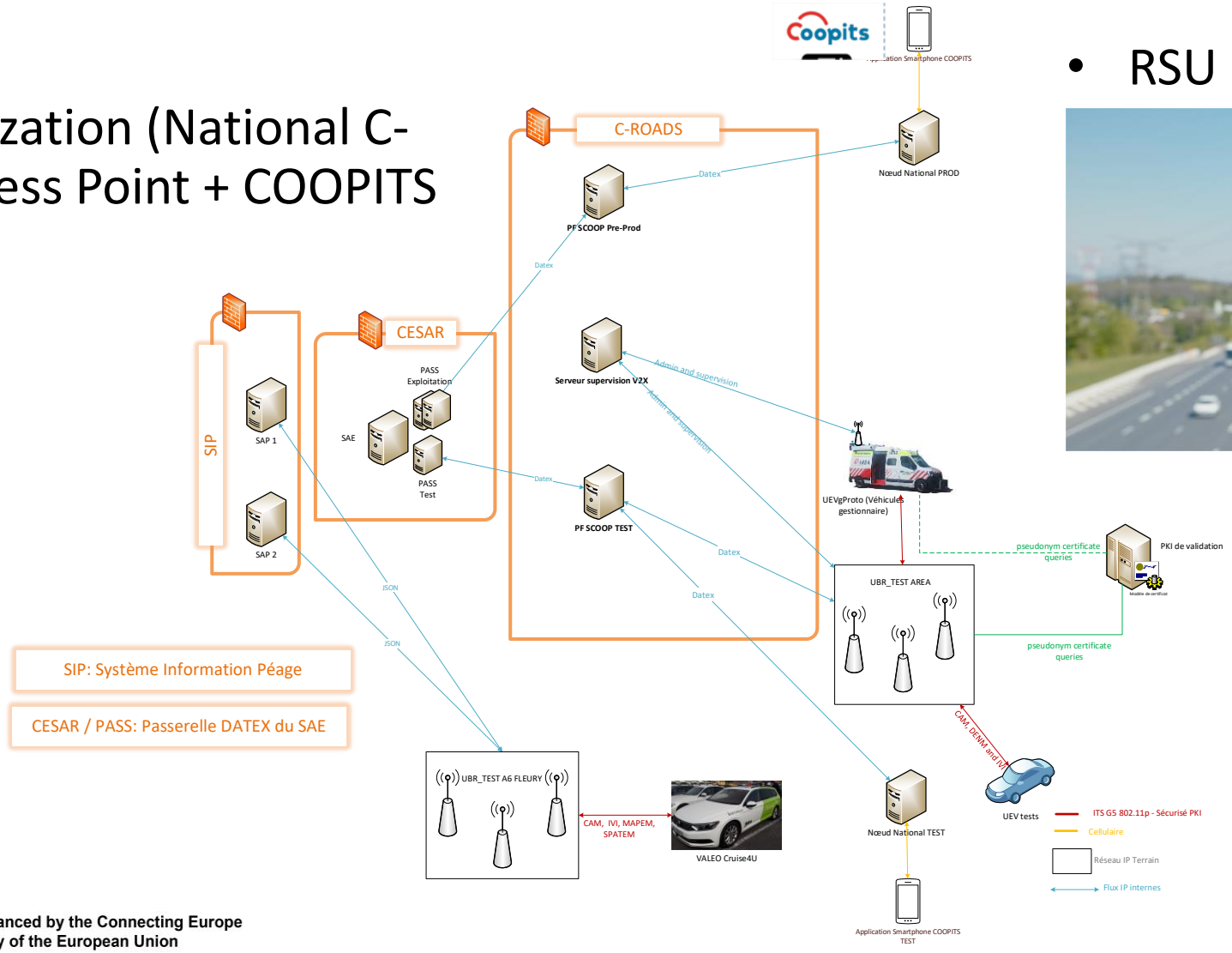
APRR - Architecture and technologies

- ITS-G5
- Hybridization (National C-ITS Access Point + COOPITS



- RSU LACROIX CITY V2X

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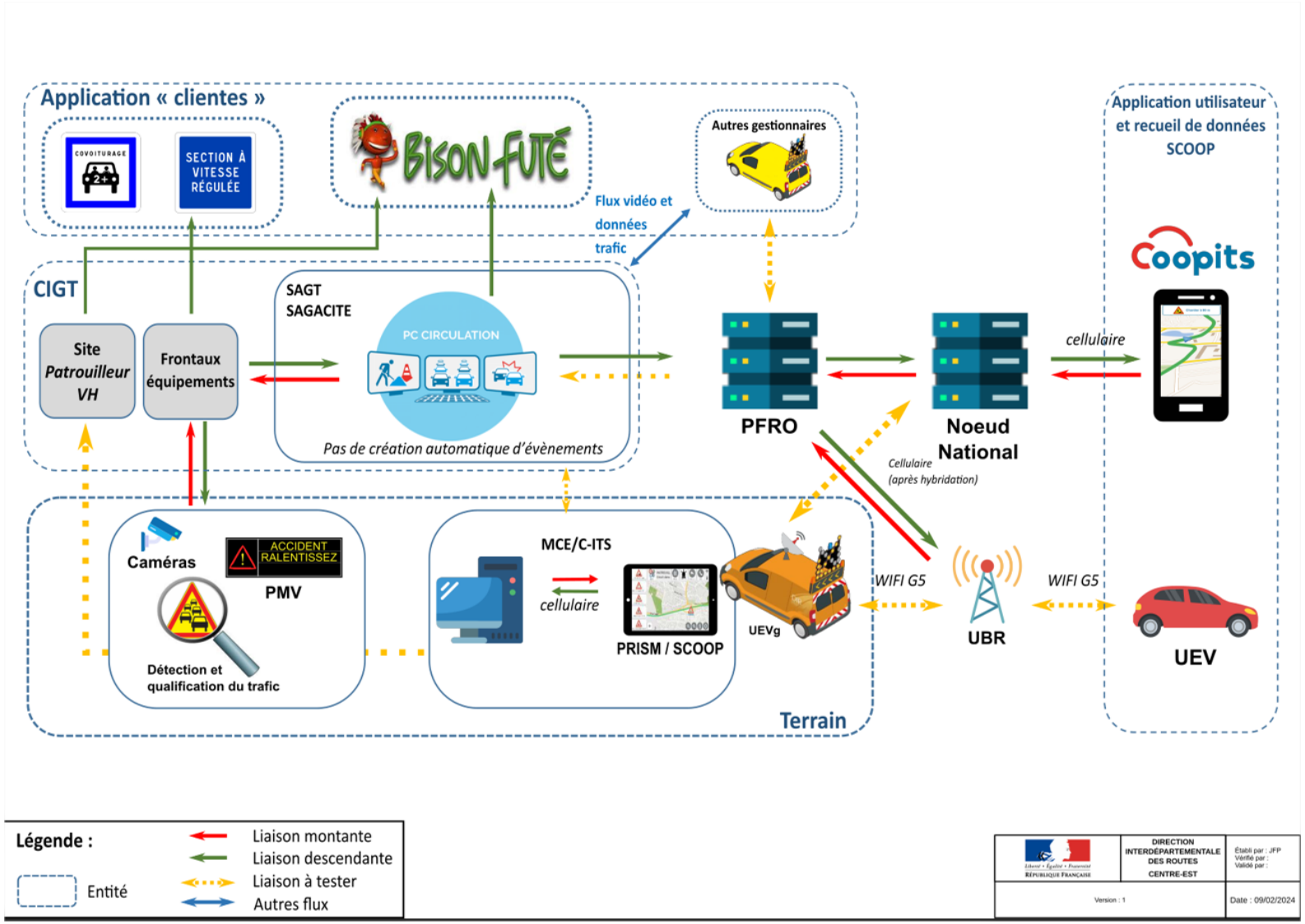
DIRCE - Architecture et technologies

- Hybridization (National Access Point+COOPITS
- RSU NeoGLS



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Prototype vehicles APRR

Intervention Van prototype

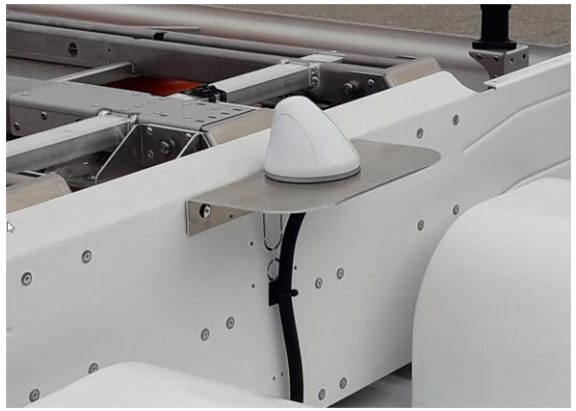
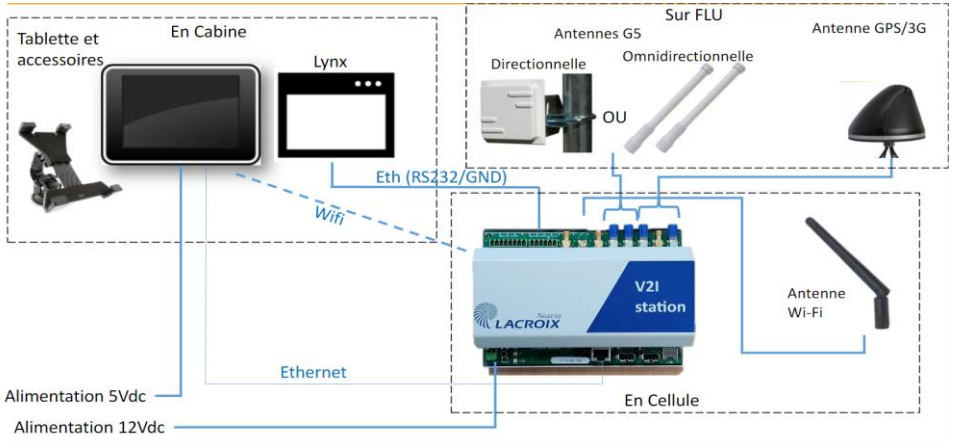


Figure 4 Dome Antenna (GPS, 3G/4G) Figure 5 Stick Antenna (GITS G5)



Lynx control Box

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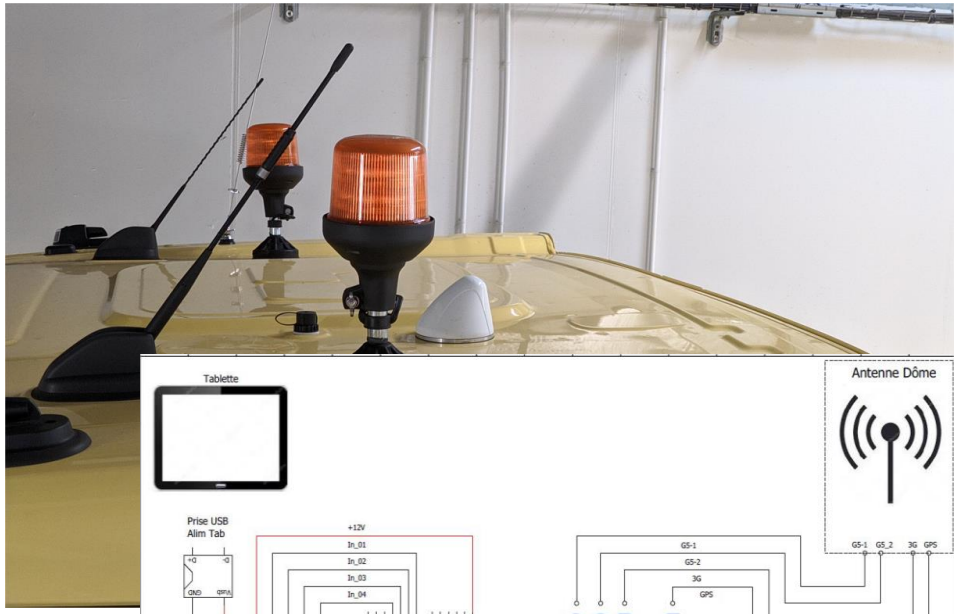
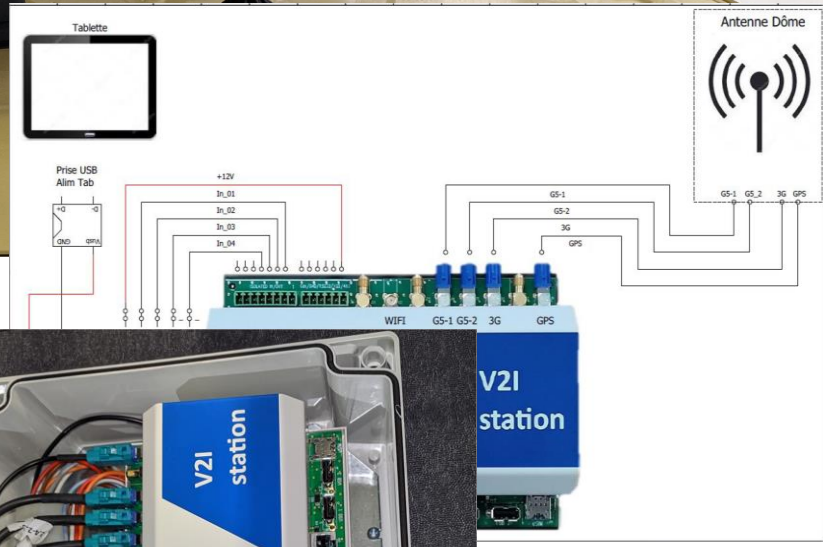
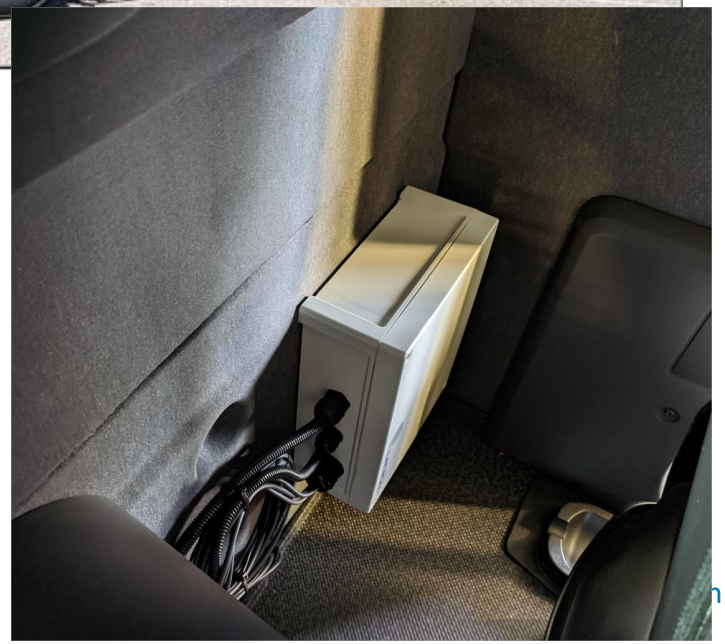
Snowplough prototype







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Successes , difficulties and continuaitons

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Successes, difficulties and continuations

- Difficulties
  - Acceptability of « prototype » on-board equipment
  - Double entry of events for agents (MCE PRISM/SCOOP)
  - Extended temporality of C-ITS projects
- Successes
  - Implementation of the complete chain SAGT ➔ COOPITS

- Difficulties
  - Maintain the place of C-ITS projects without an established ecosystem roadmap and national strategy
- Successes
  - Implementation of the complete chain SAGT ➔ COOPITS
- Continuations

  Involvement in SCALE project: Automated Vehicle driving in a motorway tunnel

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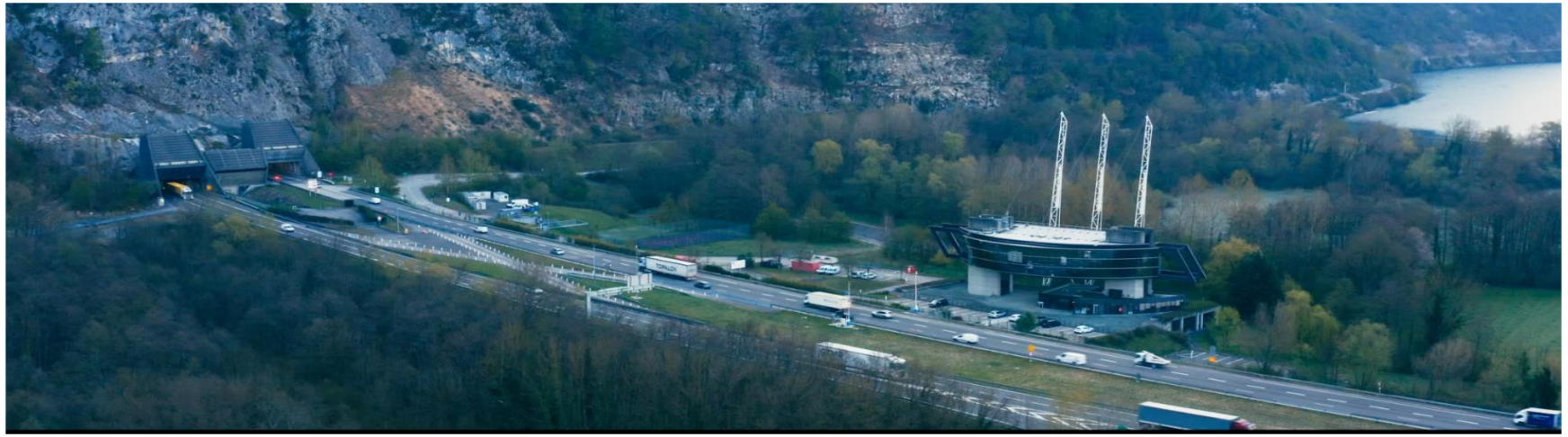

Thank You for listening

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