CARS Interdipartimental POLITO kick off

9 Febbraio 2018

5G: an enabling Platform for CARS

Pierpaolo Marchese

Technology Innovation – Standard Coordination and Industry Influencing, Head

TIM

The Car we would desire...

Please... Not this

Back to ground...

CAR...S
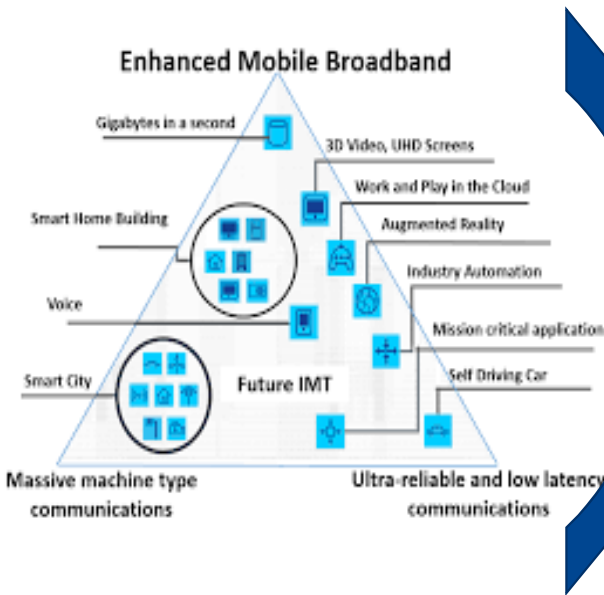# Connected Autonomous Reliable...Smart

...Sustainable, Safe, Super,...

5G

can empower the CARS dream in 2020 decade

5G at a glance

5G	A new **Network Platform** for Access and Core, evolving from 4G

Enhanced Mobile Broadband

Gigabytes in a second

3D Video, UHD Screens

Work and Play in the Cloud

Smart Home Building

Augmented Reality

Industry Automation

Voice

Mission critical application

Smart City

Future IMT

Self Driving Car

Massive machine type communications

Ultra-reliable and low latency communications

Throughput
Up to 20Gbps, DL

Latency
1/10 LTE, 1-5 ms

Batteries and Energy
>10 years, low power

Device per km²
Millions (mMTC)

Hybrid Dense Net
Small Cells,

Cloud Ready
Virtualisation, API

Network Slicing
Differentiated services

Multimedia
UHD, 8K, AR/VR
Uni/multicast

Frequencies
'00 MHz Channels
mmW, 3.5GHz,
700MHz

Security
By design

Speed
up to 500Km/h

June 2016	November 2016	September 2017	December 2017	2018	2020	2025
5G for Italy (TIM & Ericsson)	Europe 5G Action Plan	MISE bid assigned In 5 Cities	3GPP New Radio	3GPP New Core	Coverage of Selected Cities	Wide Area Coverage

A path to innovation

Establish a strong research community

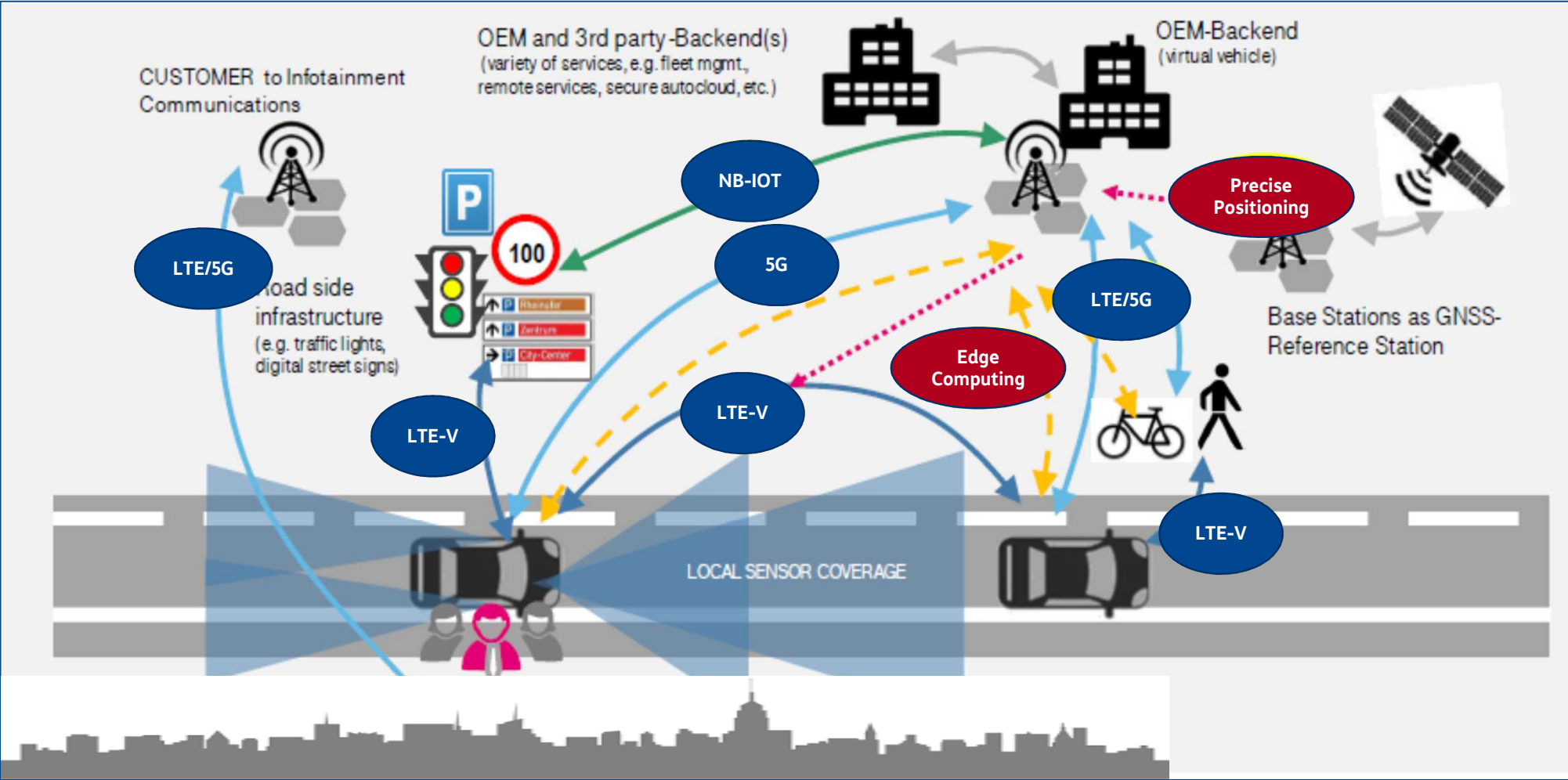**Industry and innovation pilots**

"Torino 5G"

Virtual Reality
Public Safety, Push-to-drone
Environment monitoring,
Smart City Control Room: IoT platform control center
Public Safety wearable CAM & Bracelets
Smart Parking, Assisted Driving
Connected Factory in the Cloud
Assisted Mobility and   eITS

TIM

... And many other Partners joining

Roadmap

Virtual Reality demo Tourism ; First Small Cells 23 Gbps

| 1Q2017 | | 2018 | | 2020 |

3Q2017   2019

signed MoU and kick-off

5G trial launch in the city area

Full 5G city coverage and evolution of experienced use cases
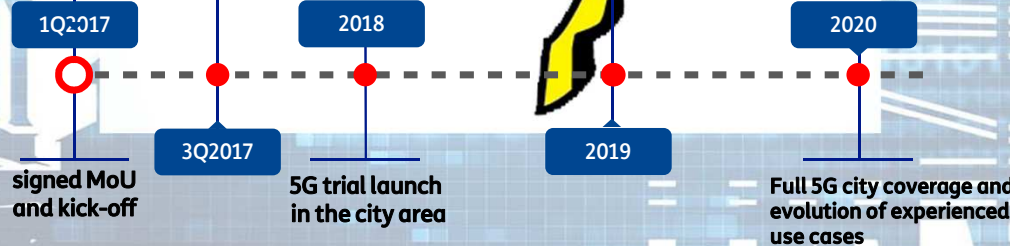
Connected Cars ... in Urban Mobility

Courtesy of Slicing Alliance, 2017

Connected Cars ... in Smart Roads

4.5G / 5G Macro-Cell

Edge Cloud

5G Small Cell/ mm-Wave

D2D/ mm-Wave

Wi-Fi

5G RRH

Cross-Border

mm-Wave

D2D
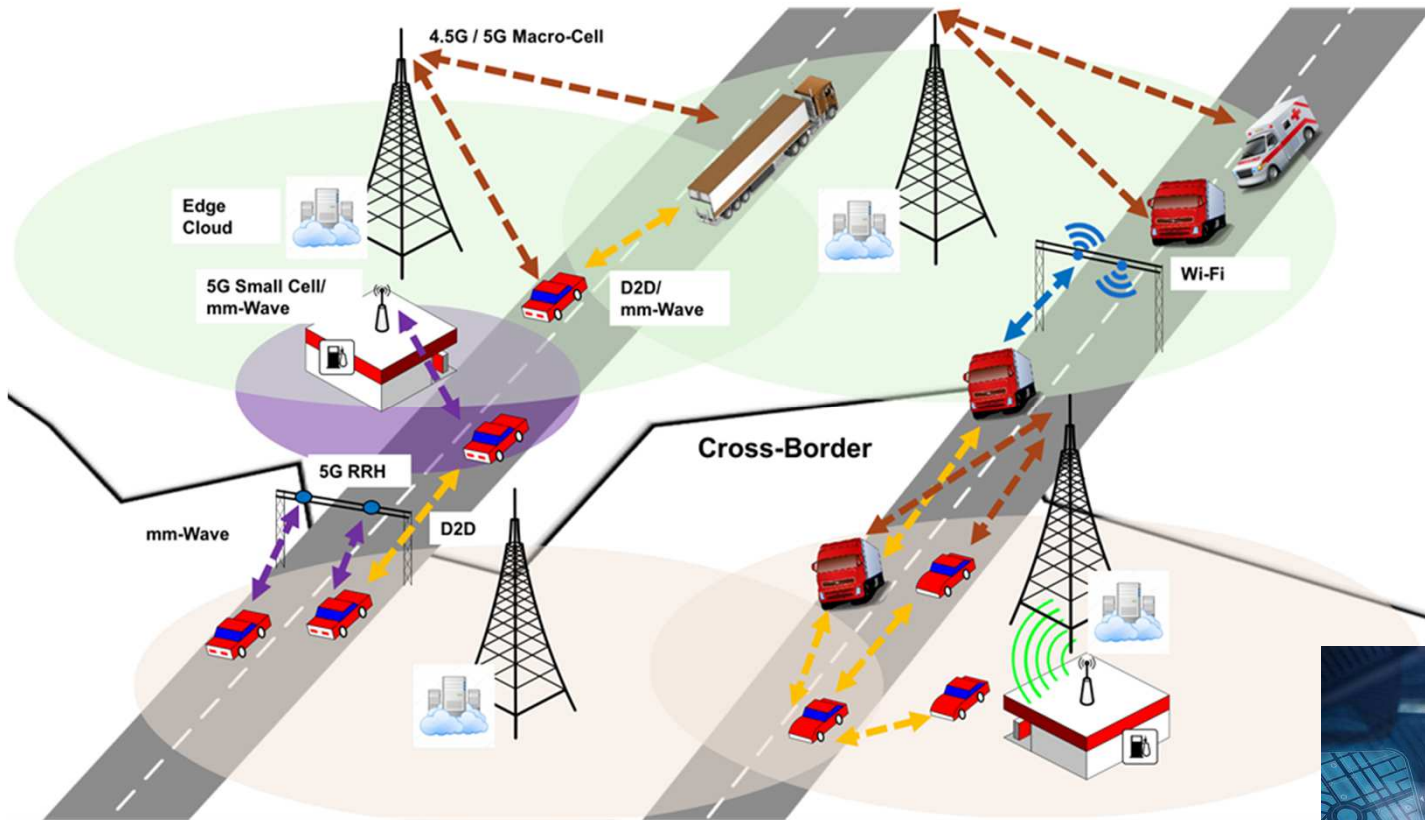
TIM elaboration from Candidate H2020 CARMEN Project , 2018

- ❑ **Neutral Host / Network as a Service**
- ❑ **Slicing and Roaming**
- ❑ **End-to-End virtualisation**
- ❑ **Mobile Edge Computing**
- ❑ **Ultra dense networks**
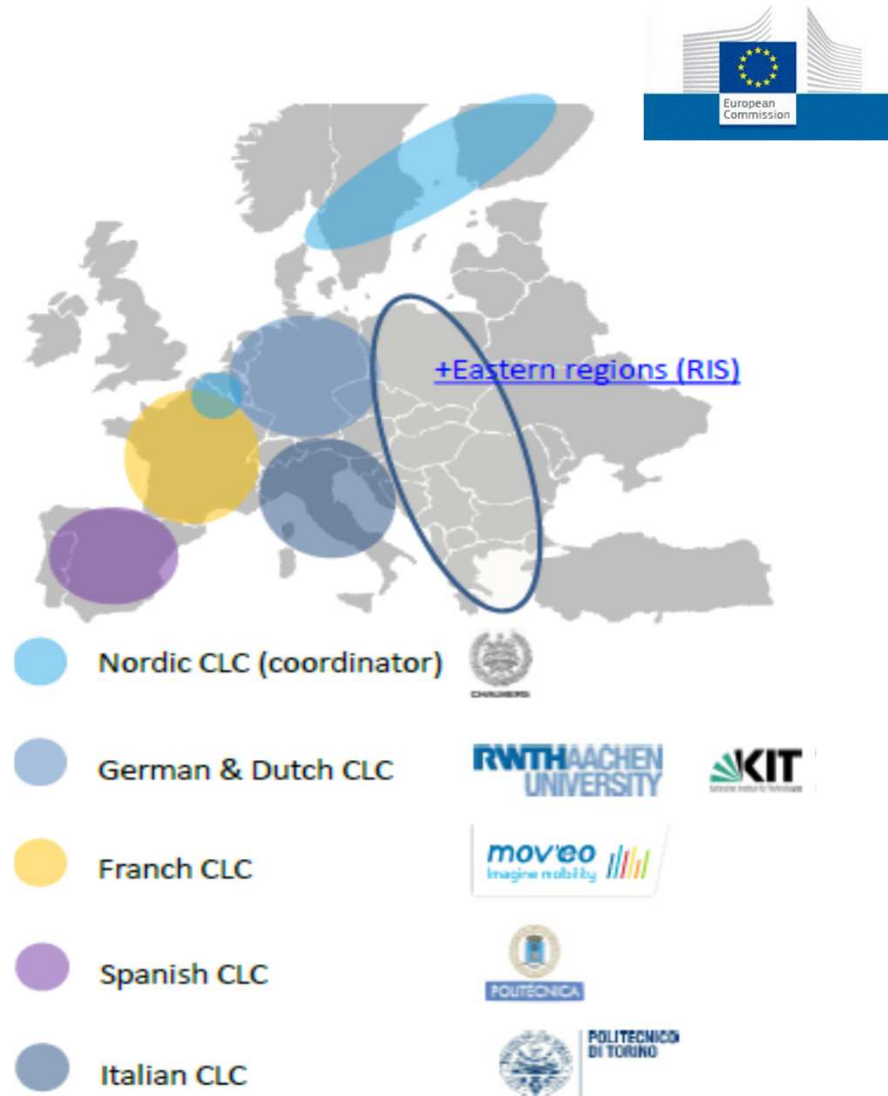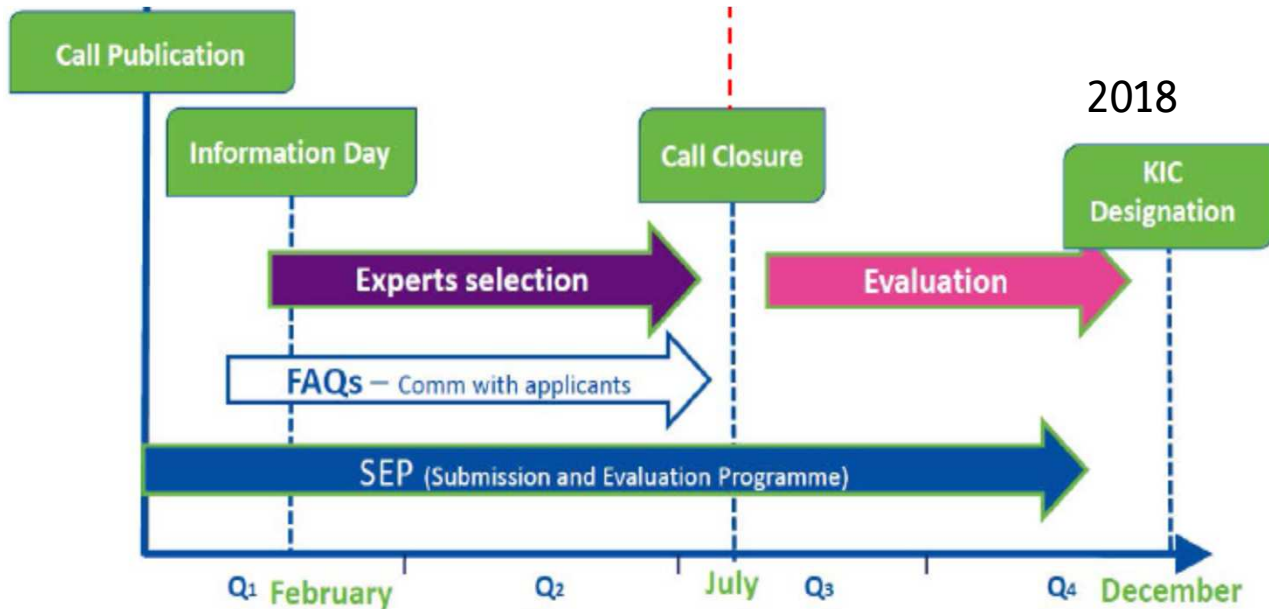- ❑ **Low latency communications**
- ❑ **Hybrid Access**
- ❑ **Spectrum sharing**

Self Driving

Connected Cars ... ecosystem

Unbundling The Automobile — Connected Cars ecosystem (Created by CB Insights, www.cbinsights.com)

Promote enterpreneurship – EIT KIC on Urban Mobility

- EIT call for proposals on KIC Urban Mobility

- KIC U-MOVE consortium: 5 geo-nodes, 50 partners

- Italian node **POLITO coordinator (KIC node location)**

- Key Italian Partners bringing different skills and approaches

+Eastern regions (RIS)

2018

Call Publication

Information Day

Call Closure

KIC Designation

Experts selection

Evaluation

FAQs – Comm with applicants

SEP (Submission and Evaluation Programme)

Q1 February Q2 July Q3 Q4 December

- Nordic CLC (coordinator) — CHALMERS

- German & Dutch CLC — RWTH AACHEN UNIVERSITY, KIT

- Franch CLC — mov'eo imagine mobility

- Spanish CLC — POLITECNICA

- Italian CLC — POLITECNICO DI TORINO

"The real voyage of discovery consists not in seeking new landscapes, but in having new eyes" (M. Proust)

GRACIAS
ARIGATO
SHUKURIA
THANK
YOU

pierpaolo.marchese@telecomitalia.it

Pierpaolo Marchese, TIM