Connectivity and 5G

Josep Paradells
i2CAT Director
UPC professor
Josep.paradells@i2cat.net
Josep.paradells@entel.upc.edu

November 12th, 2018

The Internet Research Center
Fostering your Innovation

Autonomous driving

- DARPA Grand Challenges (2004, 2005, 2007)



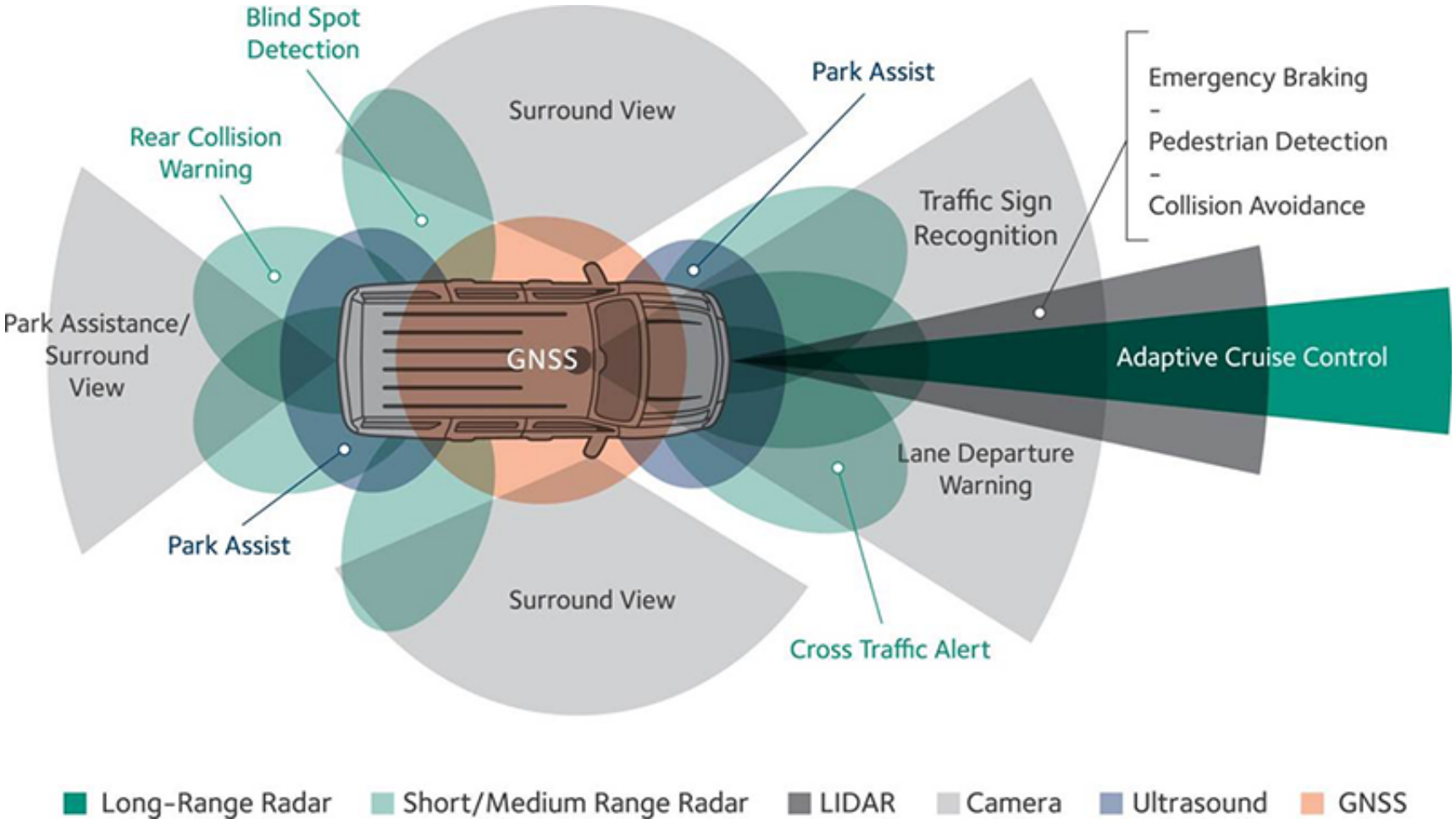
i2cat

The Internet Research Center
Fostering your Innovation

Robot driving as a human

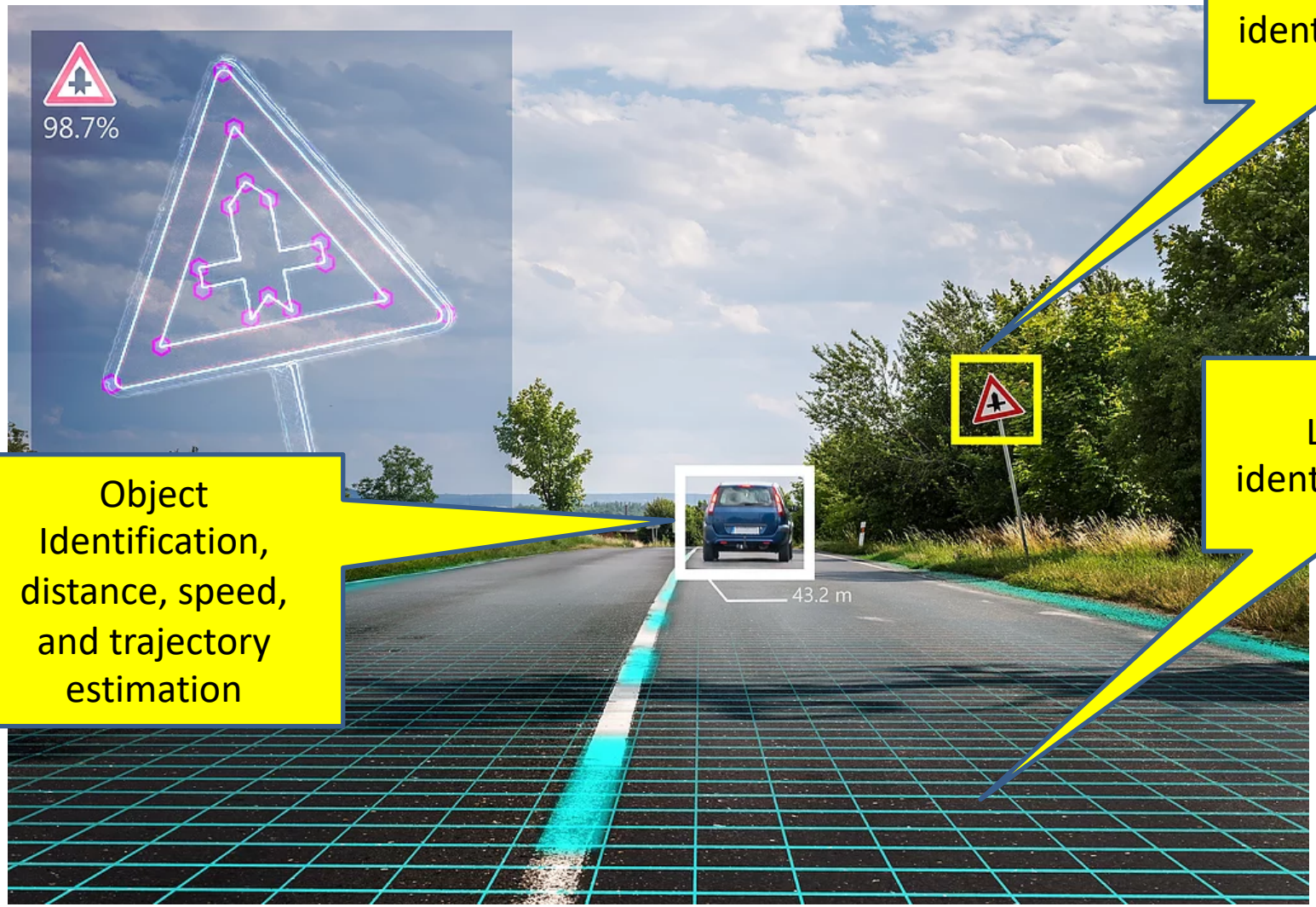


Perception sensors



The Internet Research Center
Fostering your Innovation

Image recognition



Signal identification

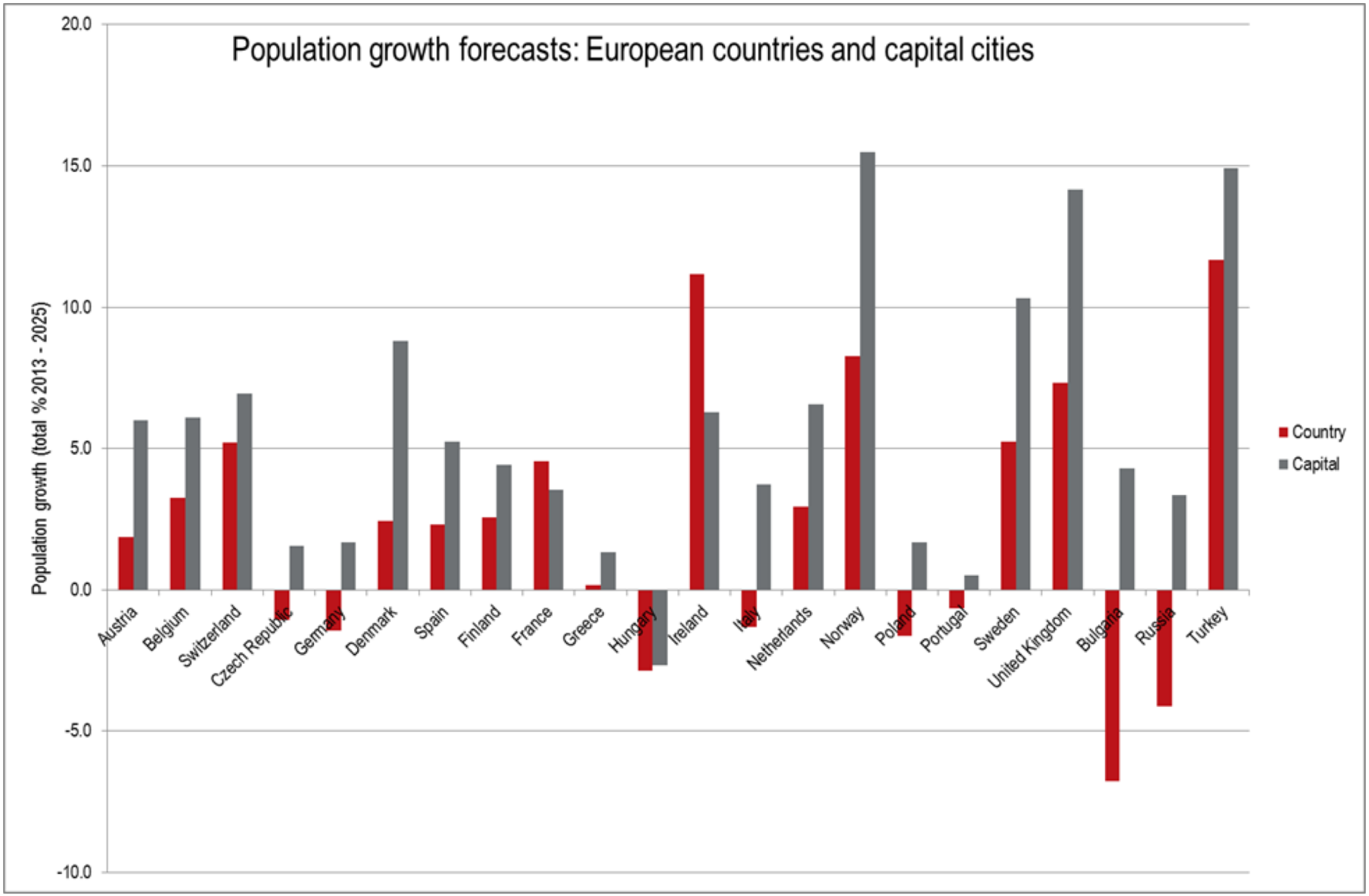
Lane identification

Object Identification, distance, speed, and trajectory estimation

Connectivity ?

i2cat
The Internet Research Center
Fostering your Innovation

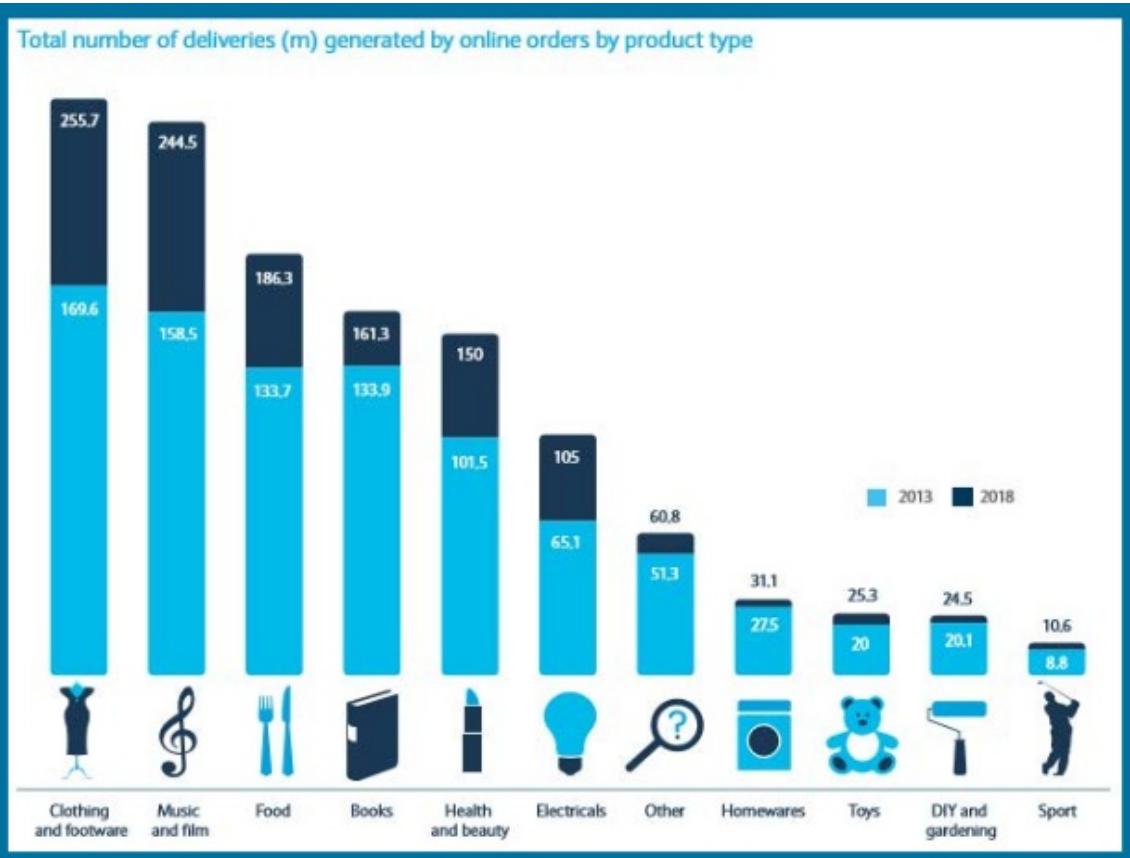
City population growth



i2cat

The Internet Research Center
Fostering your Innovation

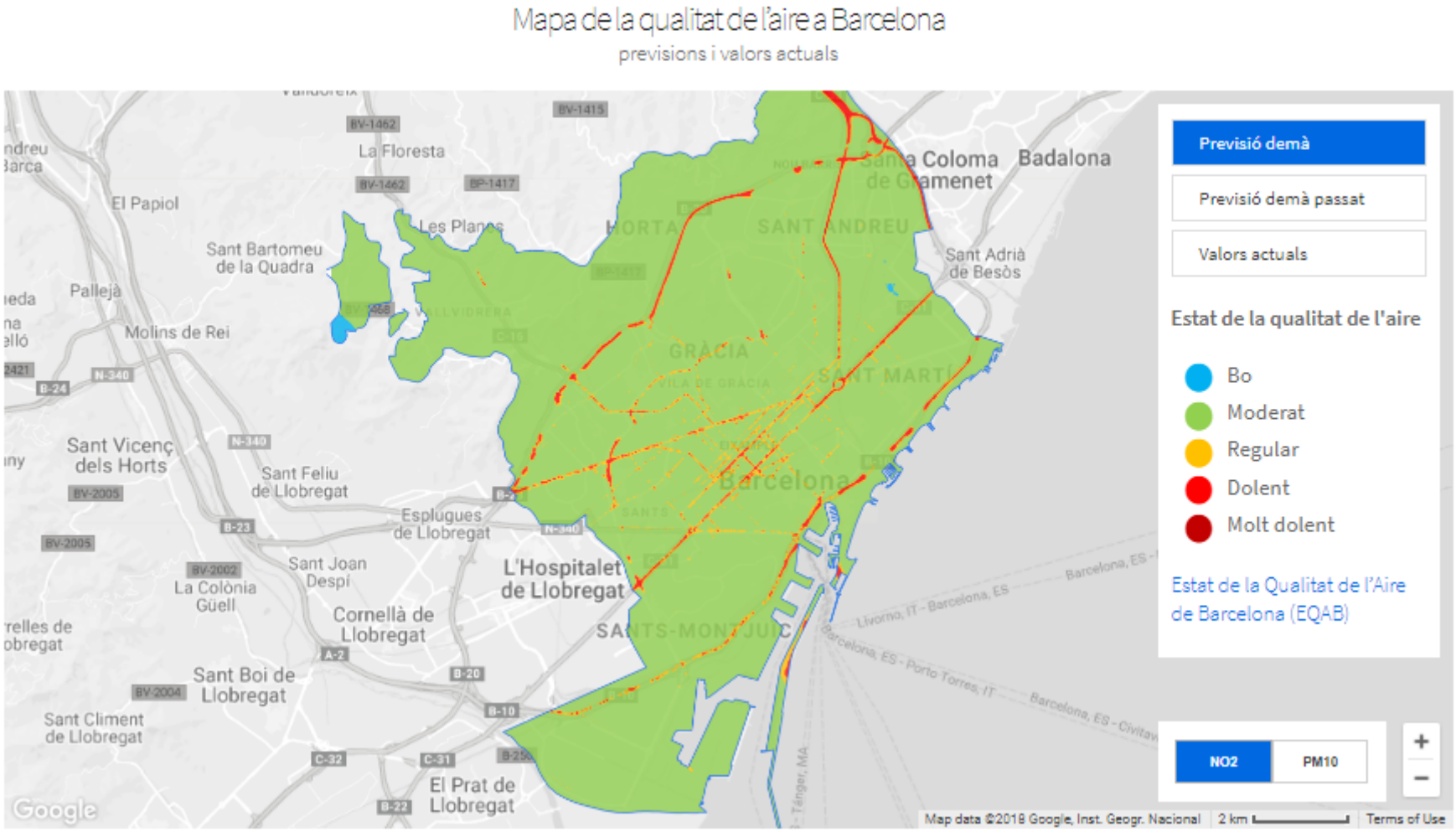
Last mile delivery



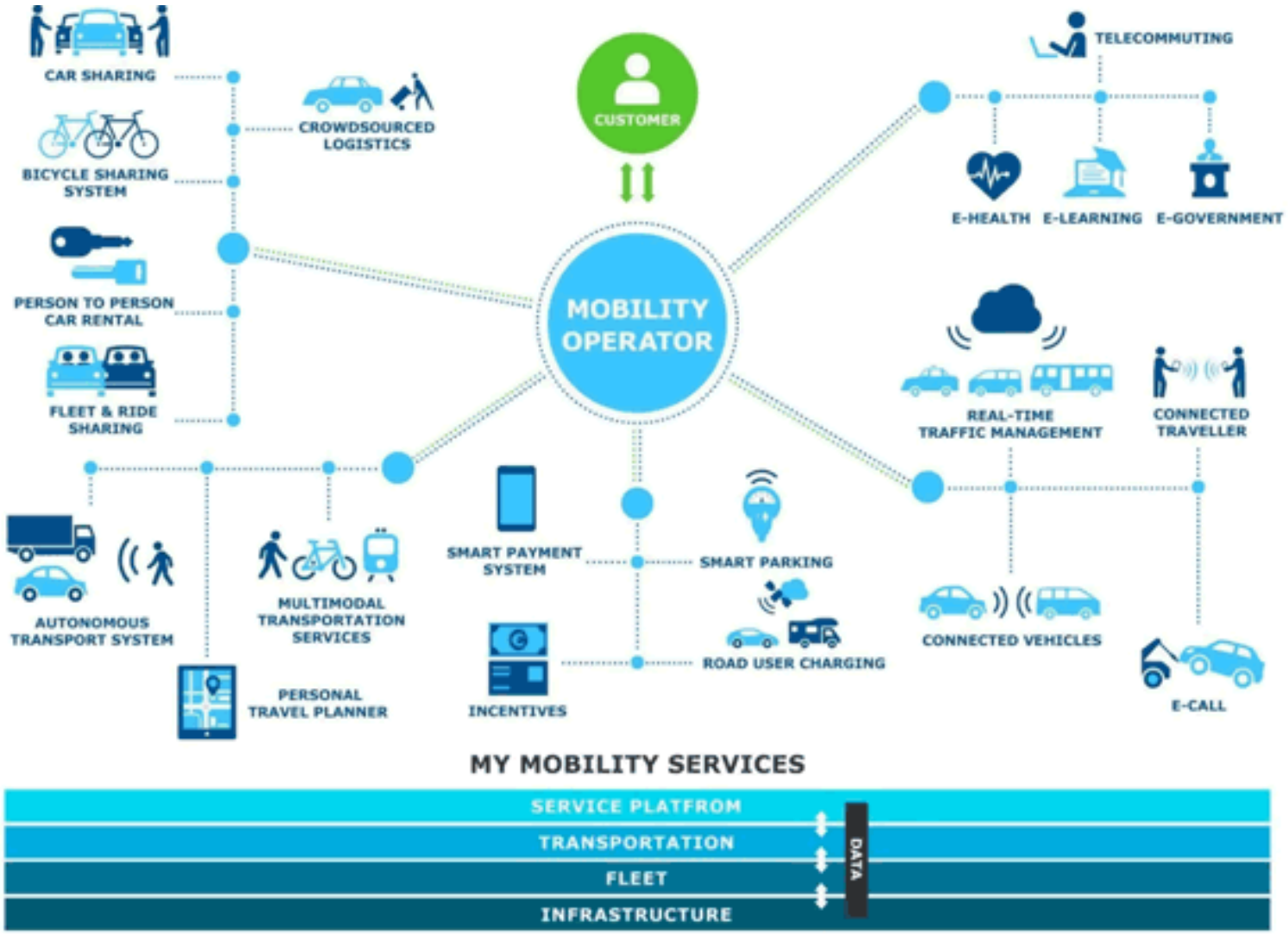
Online orders are expected to reach $1.35 billion by 2018, an increase 28.8% from 2013.

datex

Air quality


Mapa de la qualitat de l'aire a Barcelona
previsions i valors actuals
Previsió demà
Previsió demà passat
Valors actuals
Estat de la qualitat de l'aire
Bo
Moderat
Regular
Dolent
Molt dolent
Estat de la Qualitat de l'Aire de Barcelona (EQAB)
NO2
PM10
La Floresta
El Papiol
Les Planes
Sant Bartomeu de la Quadra
Pallejà
Molins de Rei
Sant Vicenç dels Horts
Sant Feliu de Llobregat
Esplugues de Llobregat
Sant Joan Despí
La Colònia Güell
L'Hospitalet de Llobregat
Cornellà de Llobregat
Sant Boi de Llobregat
Sant Climent de Llobregat
El Prat de Llobregat
Badalona
Sant Adrià de Besòs
Barcelona
Google
Map data ©2018 Google, Inst. Geogr. Nacional
2 km
Terms of Use

Mobility as a service



Efficiency

- Improve safety
- Improve efficiency
  - Usage of vehicles
  - Usage infrastructures
    - Parking places
    - Roads
  - Reduce energy consumption
    - Avoid parking search
    - Avoid congestion

Today, cars are parked the 95% of the time

Today, road space is used less than 10%



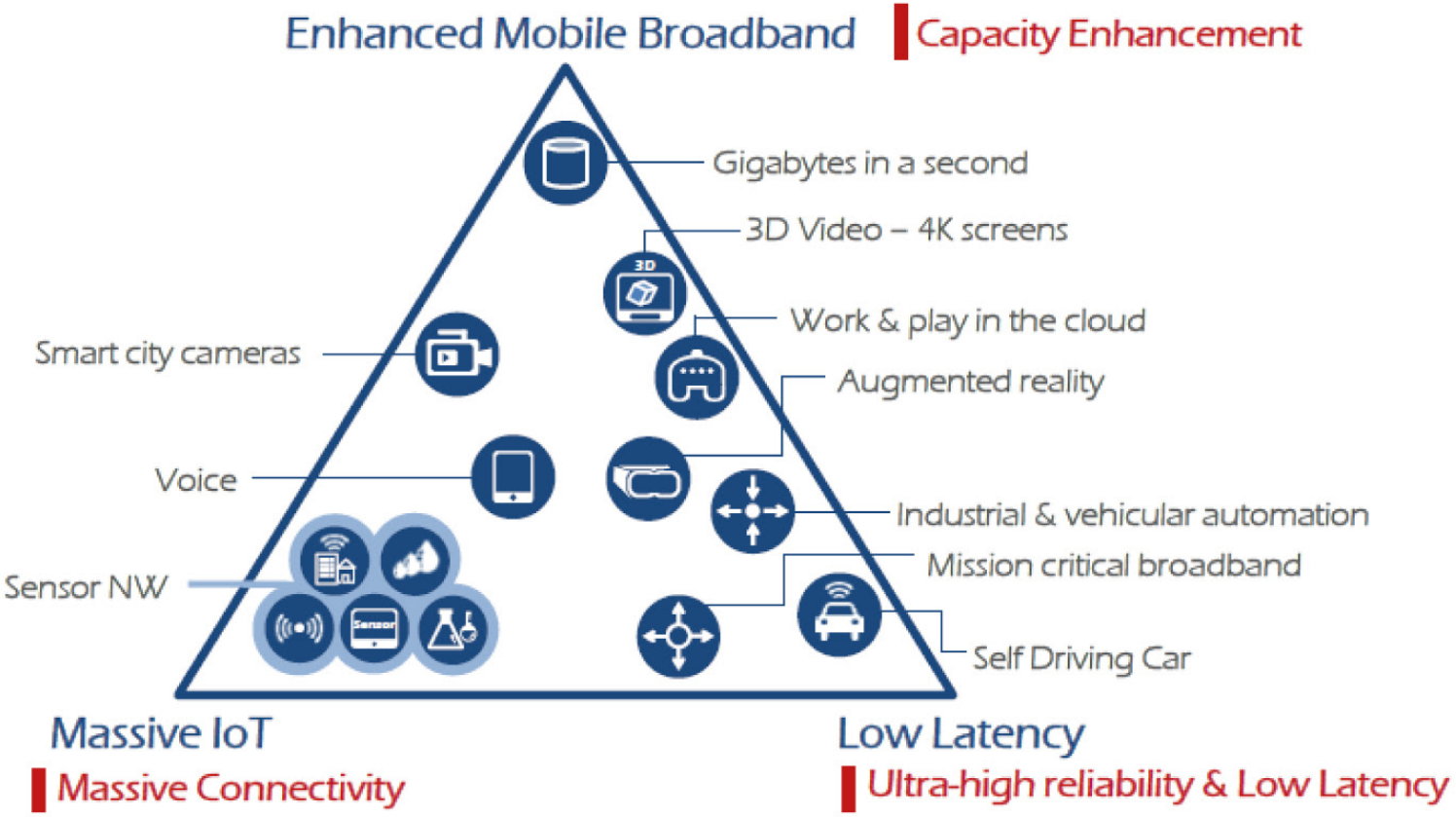
Improvements

- Cooperative awareness
- Cooperative sensing (remote sensing)
- Cooperative manoeuvres
- Vulnerable road user protection
- Traffic efficiency
- Infotainment
- Monitoring
- Teleoperated driving



5G ?

5G goals



(Source: ETRI graphic, from ITU-R IMT 2020 requirements)

i2cat

The Internet Research Center
Fostering your Innovation

The future?

