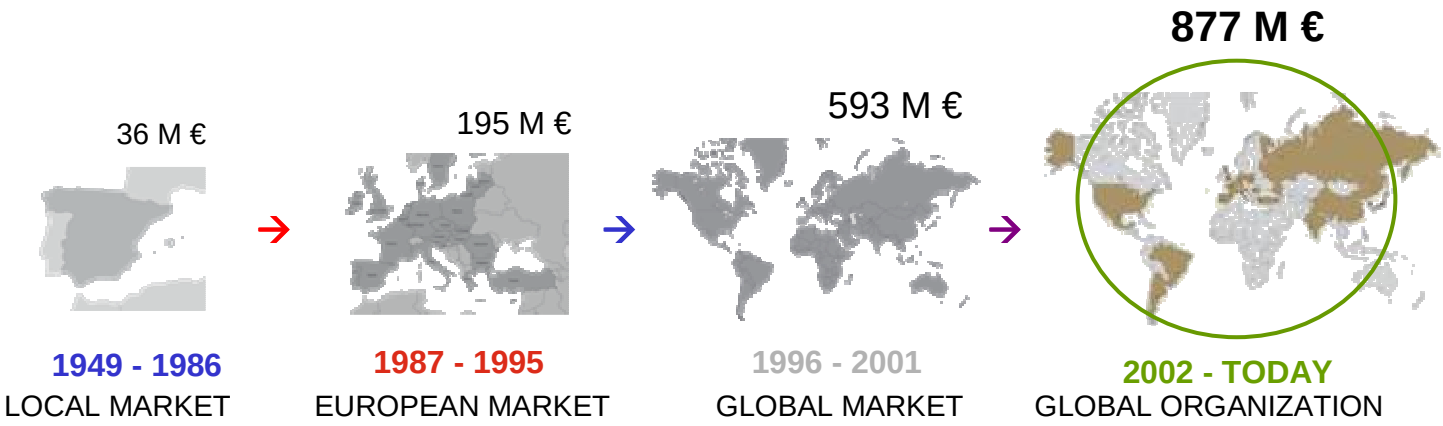
1st Barcelona Forum on Ph.D. research in EE venue

Jordi Aubert, FICOSA

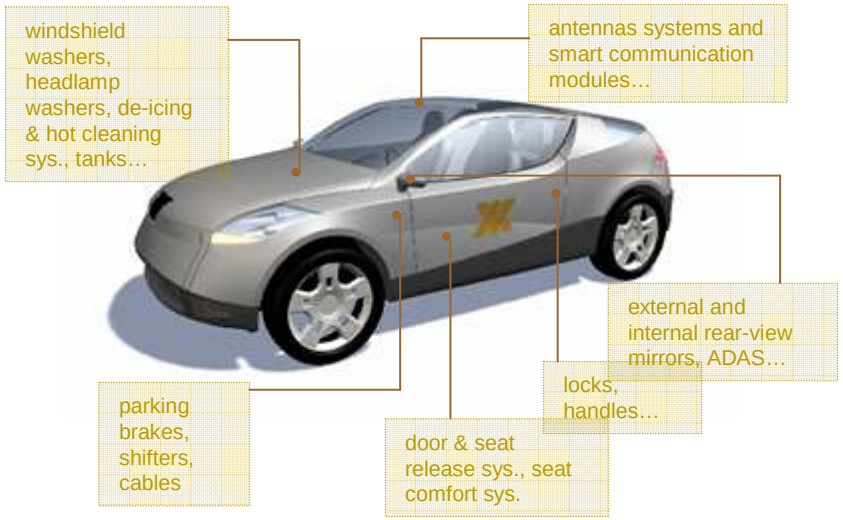
FICOSA Overview

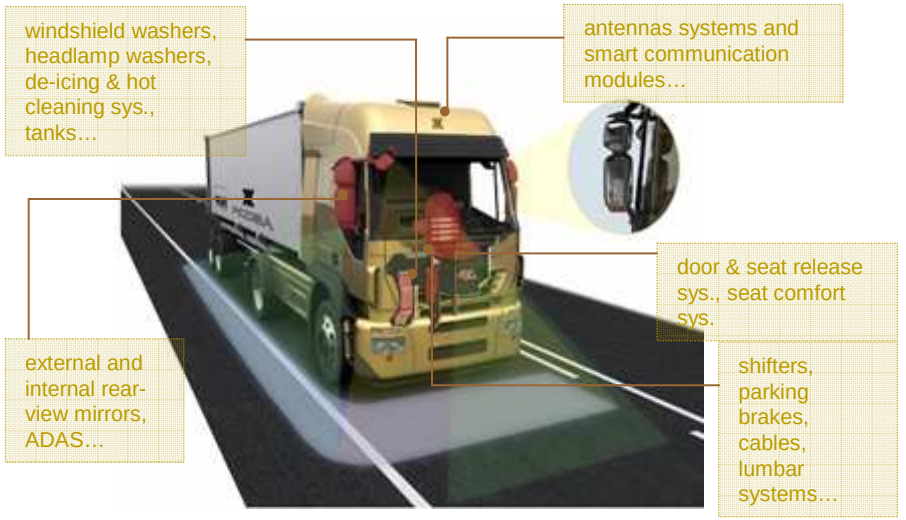
- Our business: **Global Automotive Supplier**
- 2007 Turnover: **€ 877 M**
- 2007 Team: **7,172 people worldwide**
- We are present in **19 different countries (Europe, North America, South America, Asia)**
- Headquarters in **Barcelona (Spain)**
- **Our R & D investments represent the 4% of our total Group's sales (606 patents).**

Ficosa Tech Center in Mollet del Vallès (Spain)

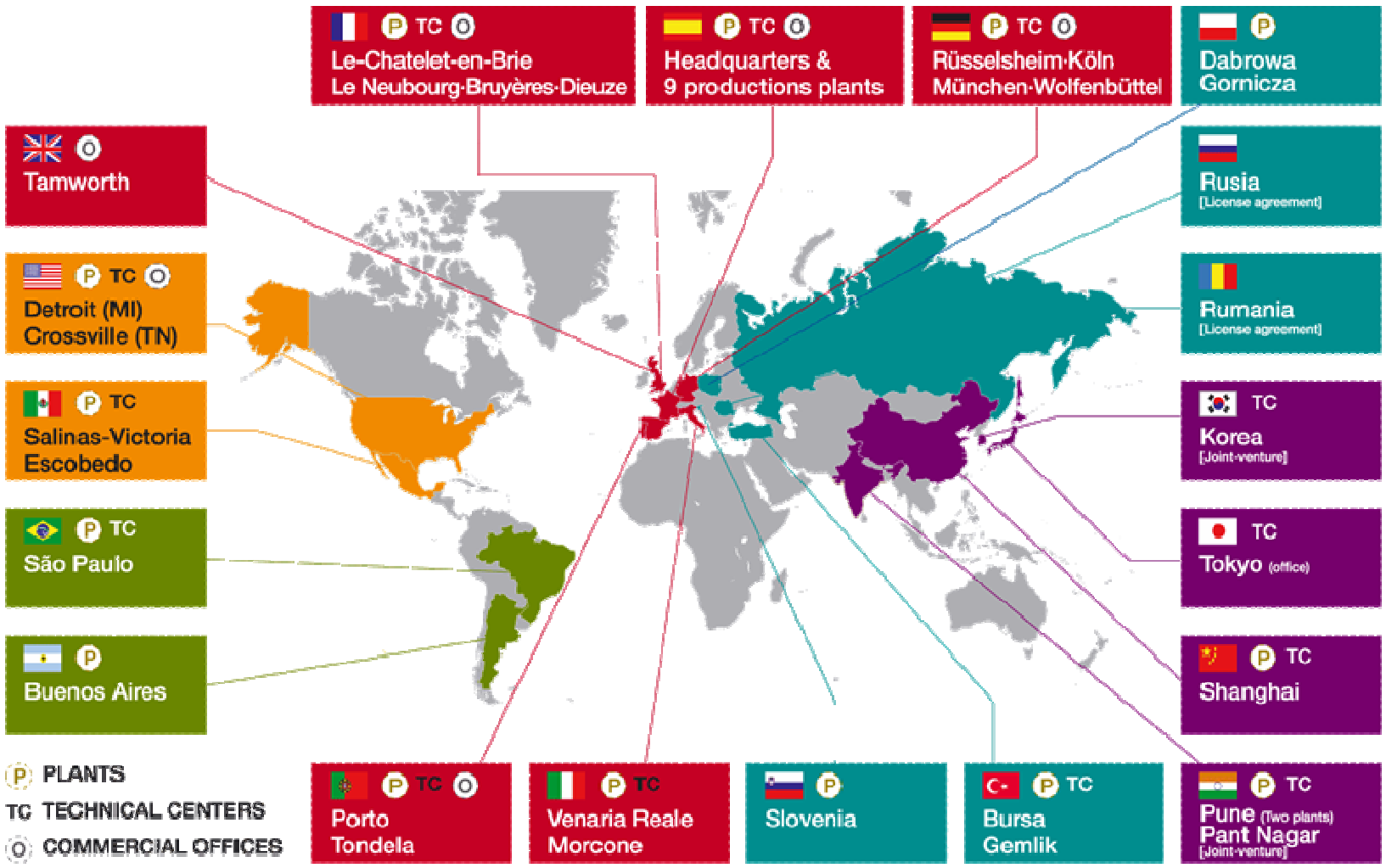


Current Business





Ficosa Global Reach

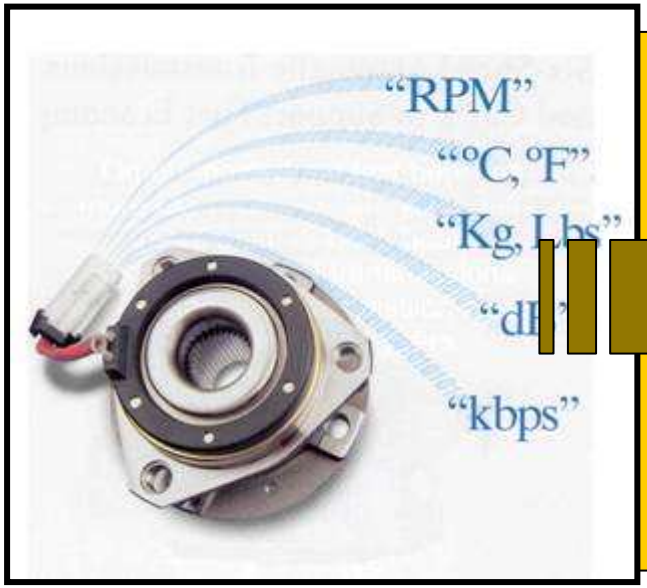


Component / System Concept

PAST

COMPONENT

FUNCTION



TODAY

COMPONENT SYSTEM

FUNCTION

INFORMATION

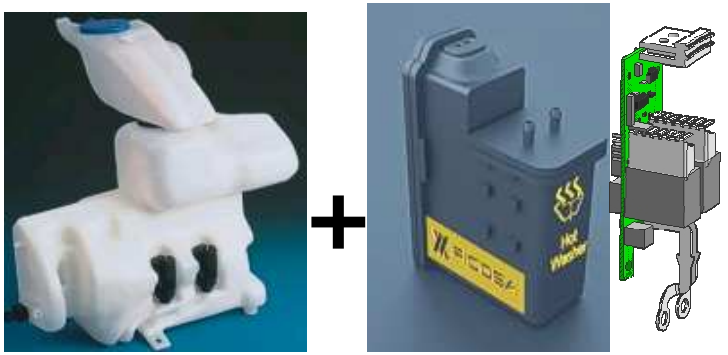
REGULATION

80% of all automotive functions are controlled by Electronics

Example: Hot Washer system

Function:
Windshield liquid reservoir + expulsion valve

Weight: 200g



Function:
Windshield liquid reservoir + heater + expulsion valve + timed activation & monitoring

Weight: 500g

Example: Exterior Mirror

1980

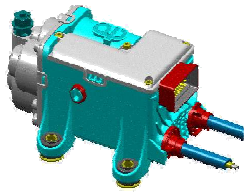
- Mirror
- Manual folding
- Mechanical mirror adjustment

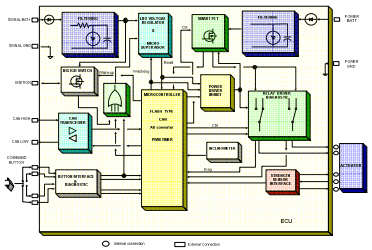
2008

- Mirror
- Heater
- Electrical adjustment with memory
- Power folding
- Courtesy Lamp
- Blinker
- Side Position Lamp
- Temperature Probe
- Blind Spot Detector
- Multi-service Antenna
- Electro-chromatic glass
- Multiplexing electronics
- …

A single mirror must be treated as a Complex System.
Integration effort surpasses the development cost of 1980 Mirrors.

Example: Electronic Parking Brake





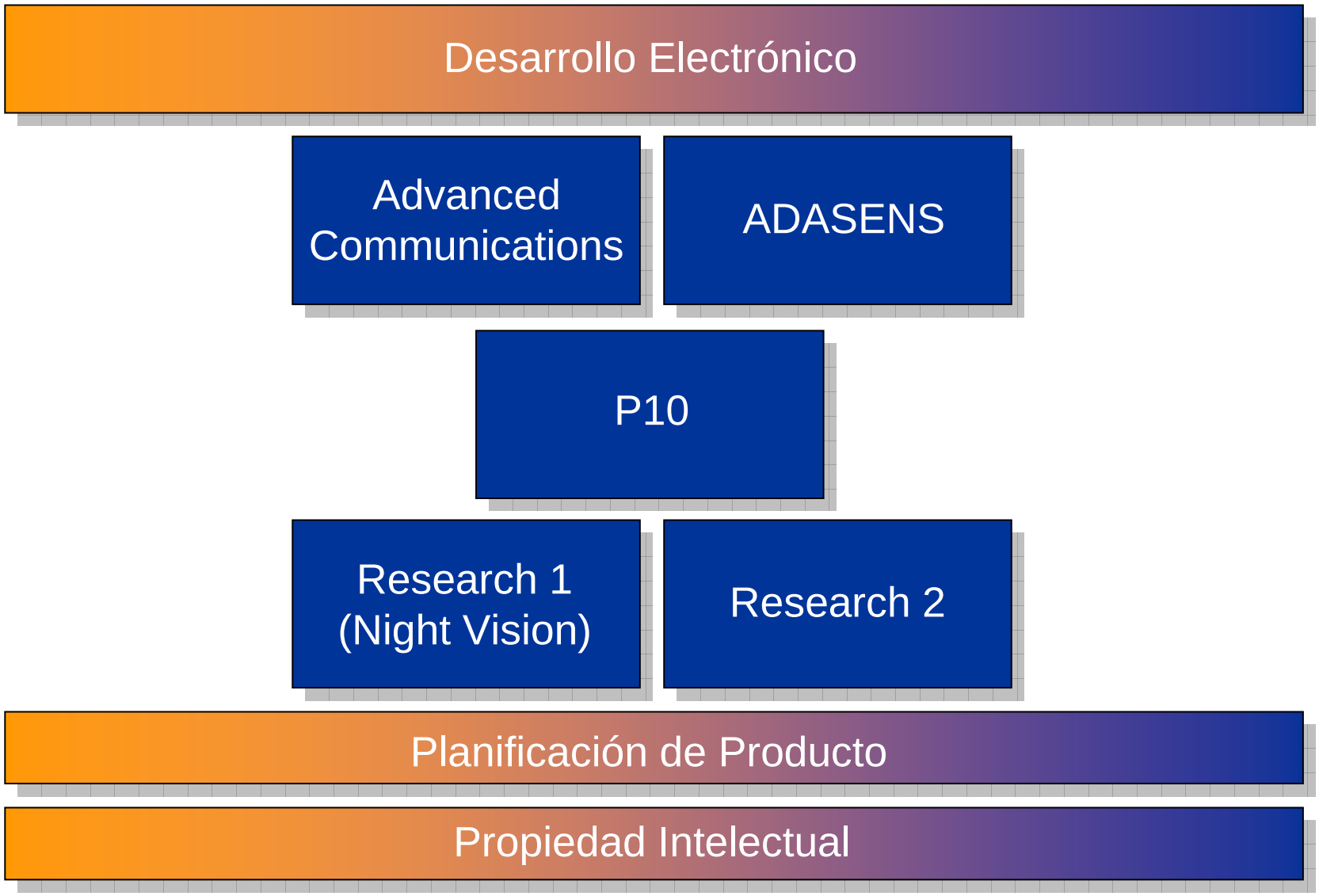
- Manual activation
- Around 9 parts: 8 mechanical, 1 electrical
- Simple vehicle interface
- Emergency braking depends on driver expertise
- Direct feedback of applied force
- Dynamics of the system are irrelevant

- Automated activation
- Around 25 mechanical parts, 500 electronic components and 40.000 lines of code
- Complex and multi-modal vehicle interface (15+ vehicle signals processed)
- Optimized and controlled emergency braking
- No haptic feedback to the driver
- Dynamic behavior is a key element

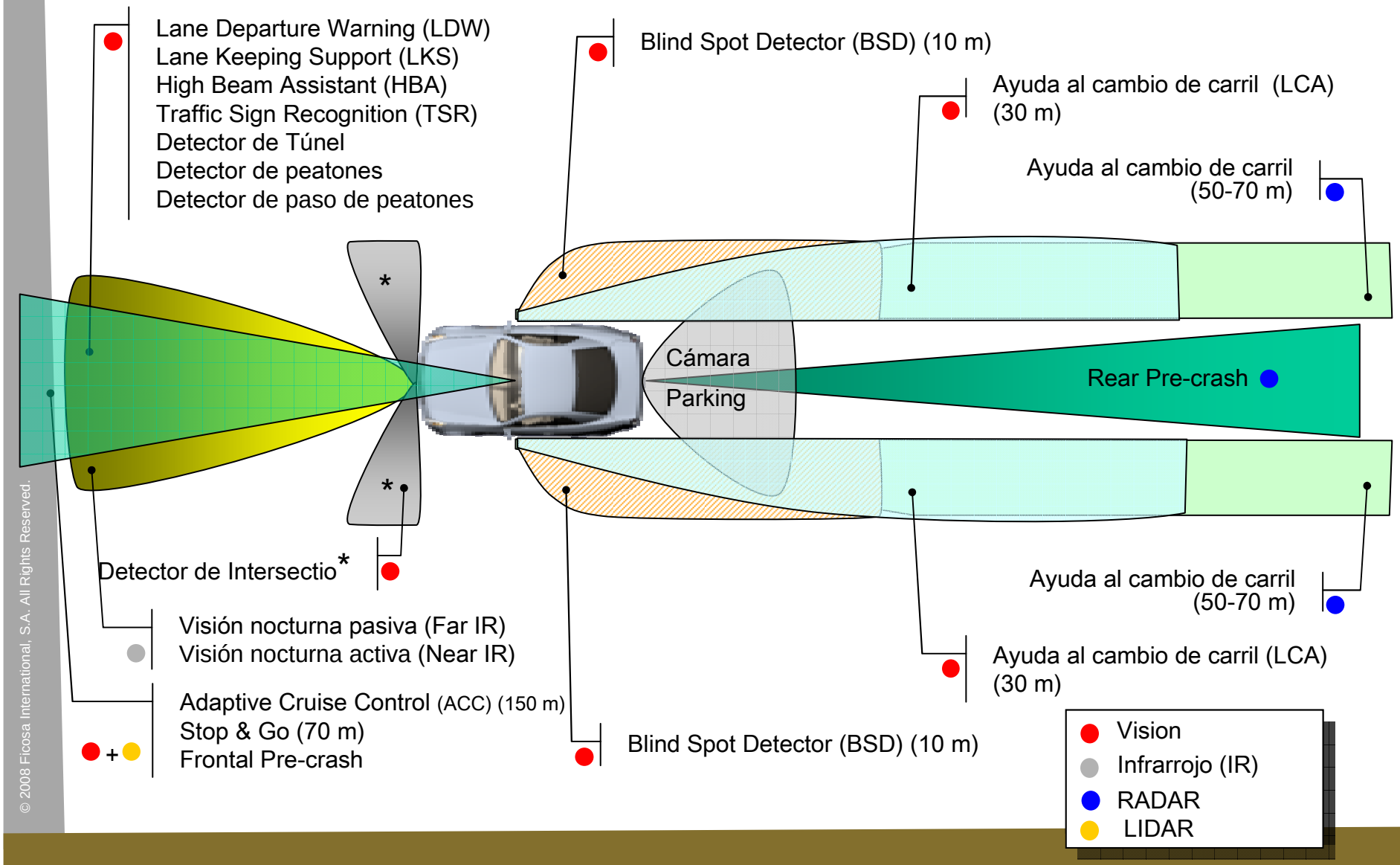
From working system to safe working system, there is a 40% overhead in components and lines of code.
Safety of operation offers huge opportunities of integration.

FICOSA Technology Division

DIVISIÓN DE INNOVACIÓN



Fusión de tecnologías ADAS



ADVANCED COMUNICATIONS

INTEGRATED ANTENNAS IN VEHICLES

Integrated antenna and RF systems into car plastic body parts for broadcasting bands..

ANTENNAS FOR NAVIGATION AND SHORT RANGE

Integrated Antennas for PND and Antennas for Short Range Applications in vehicle.

TELEMATIC PRODCUTS

Smart and compact communication modules to satisfy the demand of telematic services in the vehicules.

AERONAUTIC AND SECURITY ANTENNA SOLUTIONS

Antennas for communication, navigation and identification applications in the world of aeronautics and security applications.

Configuration (example)

Left rear-view mirror

- AM/FM 1
- GPS
- TV 1

Right rear-view mirror

- FM2
- DAB
- TV 2

in-Vehicle Telematic Unit (iVTU)

110 x 68 x 27 mm

The **iVTU** is a compact and cost effective telematic solution to enable security and safety services in the vehicle. The **iVTU** is designed to minimize the installation costs and maximize system robustness in case of accident and external manipulation.

Main characteristics and benefits:

- Enabled by current technology and capable to integrate new ones to **support future telematic services**
- **Cost effective** and **compact** electronic design
- Optimal design and performance of **integrated antennas**
- **Easy installation**, only one connector to the vehicle
- **System robustness** in case of accident and external manipulation thanks to integrated antennas in the same module
- Current products:
  - **iVTU 2.0** for Emergency Services
  - **iVTU 2.1** for Anti-Theft Services