

Intelligent Vehicles and Cooperative Systems



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RENAULT sas

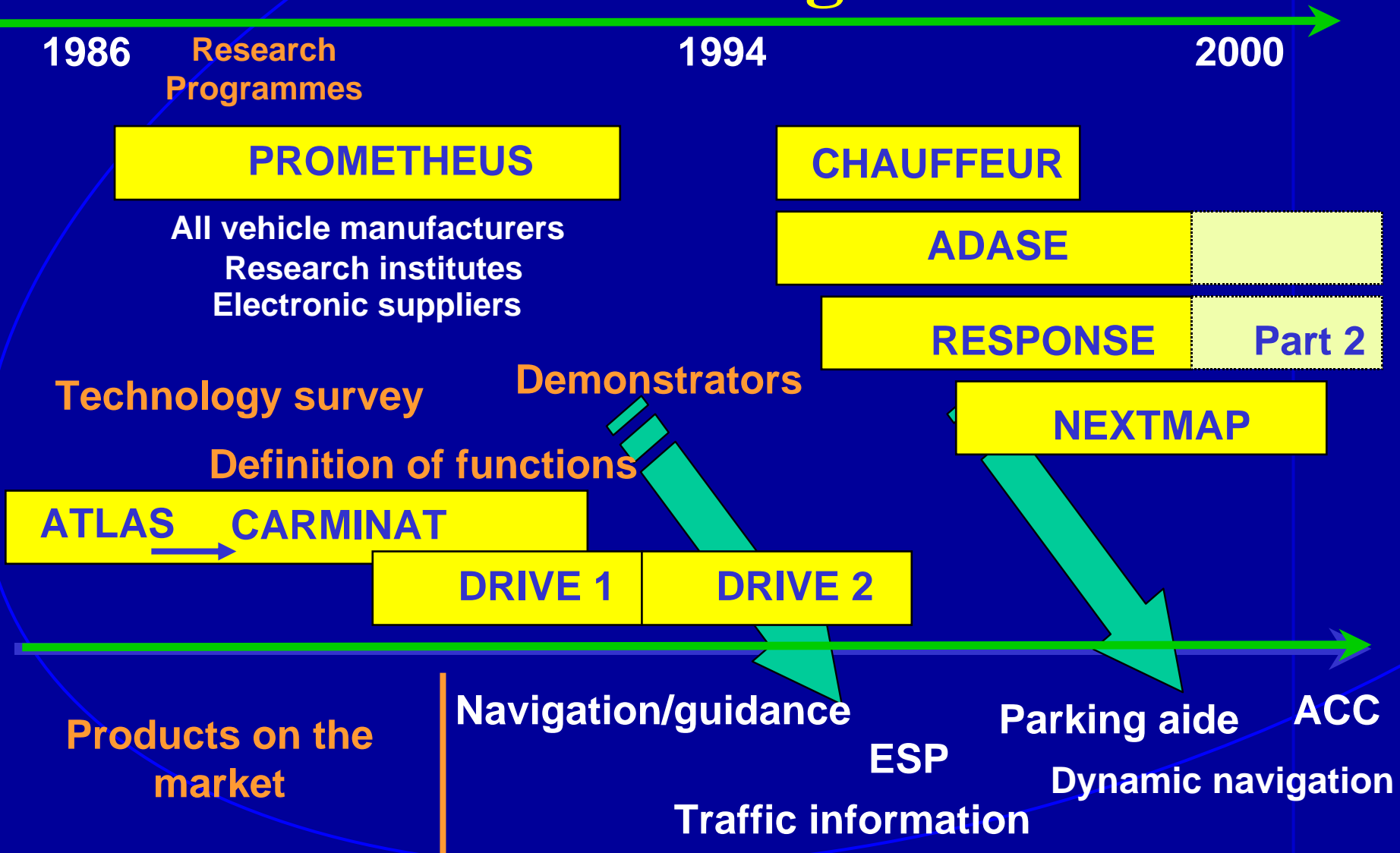
Transportation Policy Delegate

Member of the Board of ERTICO

Member of the eSafety steering group

Member of the eSafety HMI WG

ITS development in Europe Historical Background



THE OBJECTIVES



➤ IMPROVED SAFETY

But also

❖ IMPROVED EFFICIENCY → MORE THROUGHPUT

❖ MORE CONFORT → ACCEPTABILITY

BASIC HYPOTHESIS



- **The Renault strategy on intelligent vehicle is in complete coherence with the logic of the Integrated Safety System**

DRIVER ↔ VEHICLE ↔ INFRASTRUCTURE

- **The Renault strategy respects the responsibility of the driver who remains in the "loop" of the ADAS functions**
- **That does mean that we are not applying automatic corrections during emergency phases**

INTEGRATED SAFETY



Psychology of the Behaviour



Normal Driving Conditions

10 s

To Assist

To Inform

Emergency Phase

5 s

To Alert

To Apply Automatic correction

1 s

Pré-crash Phase

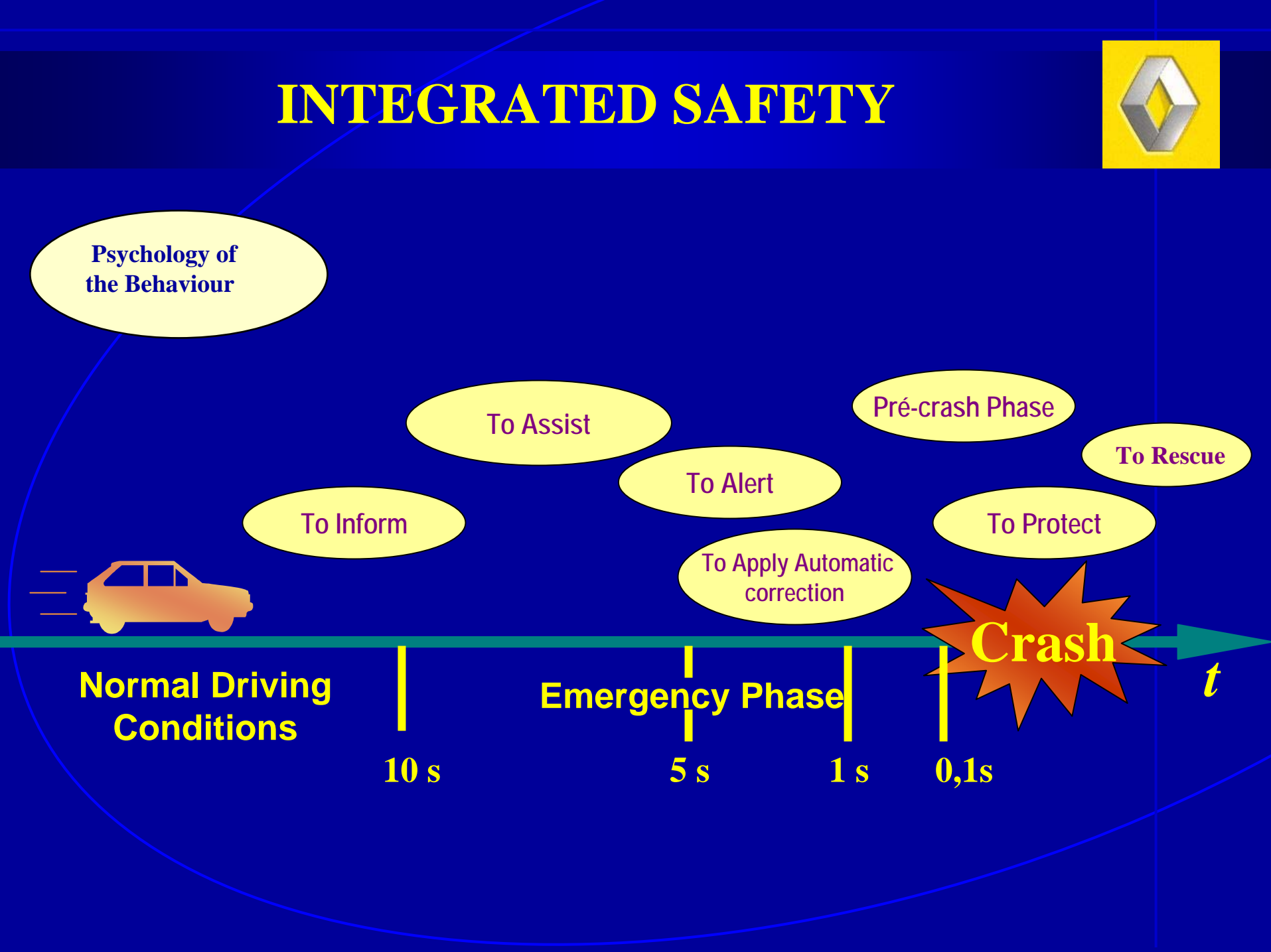
To Protect

Crash

0,1s

To Rescue

t



ADAS

Advanced Driver Assistance Systems



The Strategy of Car Makers:

Driver Assistance and **NOT** Automated Driving

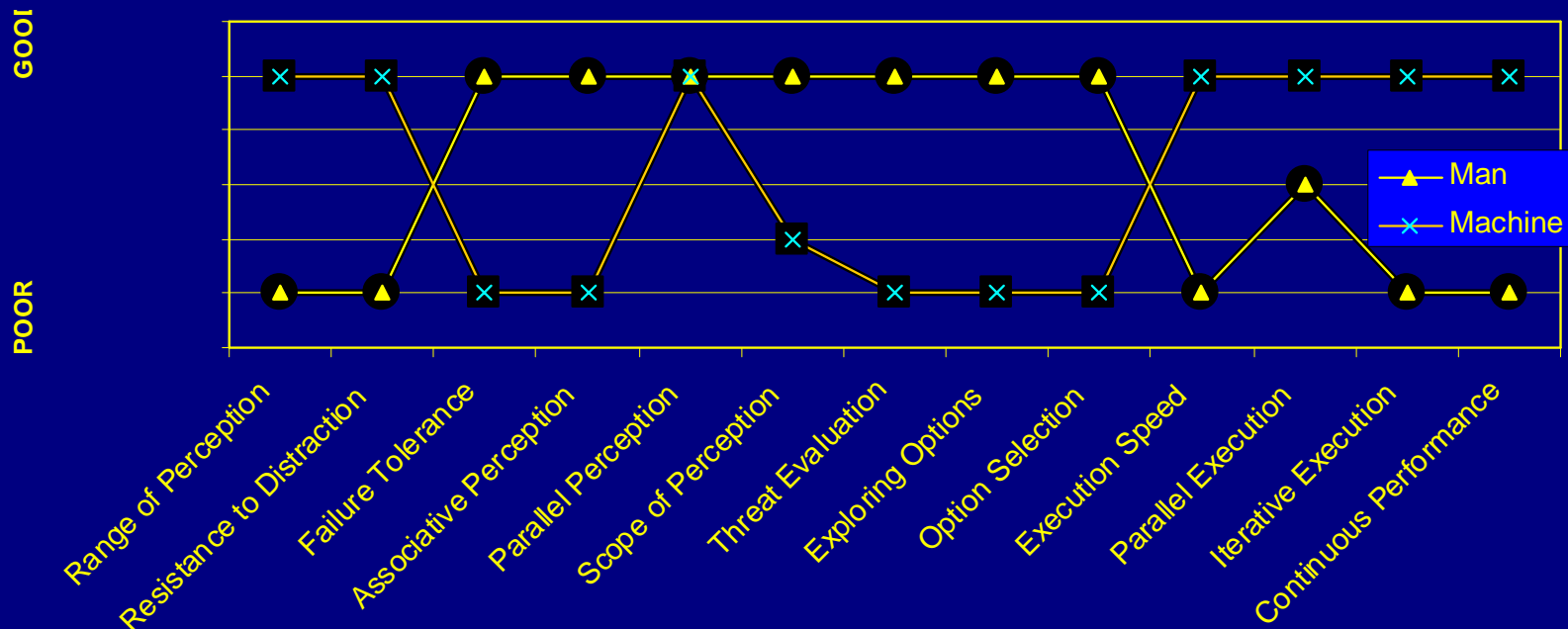
WHY?

BECAUSE:



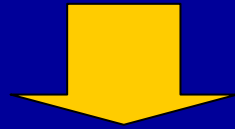
- **Power and weaknesses of Human and Machine(see next slide)**
- **Liability in case of automation of the driving :**
 - who would be responsible for what ?**
- **No scénario of deployment because:**
 - #who would buy an automated vehicle while there is no infrastructure to use it ?**
 - #who would build an "automated" highway while there is no vehicle to use it ?**

POWERS AND WEAKNESSES OF HUMAN AND MACHINE





THE FUTURE



**CO-OPERATIVE VEHICLE
INFRASTRUCTURE SYSTEMS**

CVIS - a strategic vision



Cooperative Vehicle-Infrastructure Systems : potential big wins in road safety & network management

- safer vehicles, more driver support & assistance = fewer accidents
- better prediction & management of traffic flow = less congestion

Issues to overcome



➤ Social, legal, technical.

Some examples:

- Proving the business case - *tangible* benefits set against what cost?
- Technical - standards, compatibility
- Legal - liability, privacy, responsibility
- Institutional and Organisational

Possible Functional Bundles (1)



- Low Tech - Near Term
 - ACC, VMS, Network condition data, Driver information and navigation.
- Fairly Low Tech - Safety and Network Support
 - Speed alert, Ramp Metering, e-Call, IVHW, Collision Warning,

Possible Functional Bundles (2)



- Medium Tech - Control and Assistance
 - Collision Warning and Assistance (CWAS), Lane keeping/Lane control, Stop&Go, Access Control
- High Tech - Control and Assistance
 - Priority operations, ACC with inter vehicle communication, Intelligent merging, CWAS integrating infrastructure and vehicle based applications (eg. intersection collision avoidance).

Migration: 15-20 Years?



TODAY

Driver in full control of vehicle

Speed/behaviour monitored by Police

Limited real-time information (VMS, RDS-TMC)



15 - 20
YEARS

-
- **Driver assisted by in-car technology (close following etc)**
 - **Driver manoeuvre / collision warning**
 - **External speed alert**
 - **Real-time information on conditions**
 - **Driver in command, rather than control**



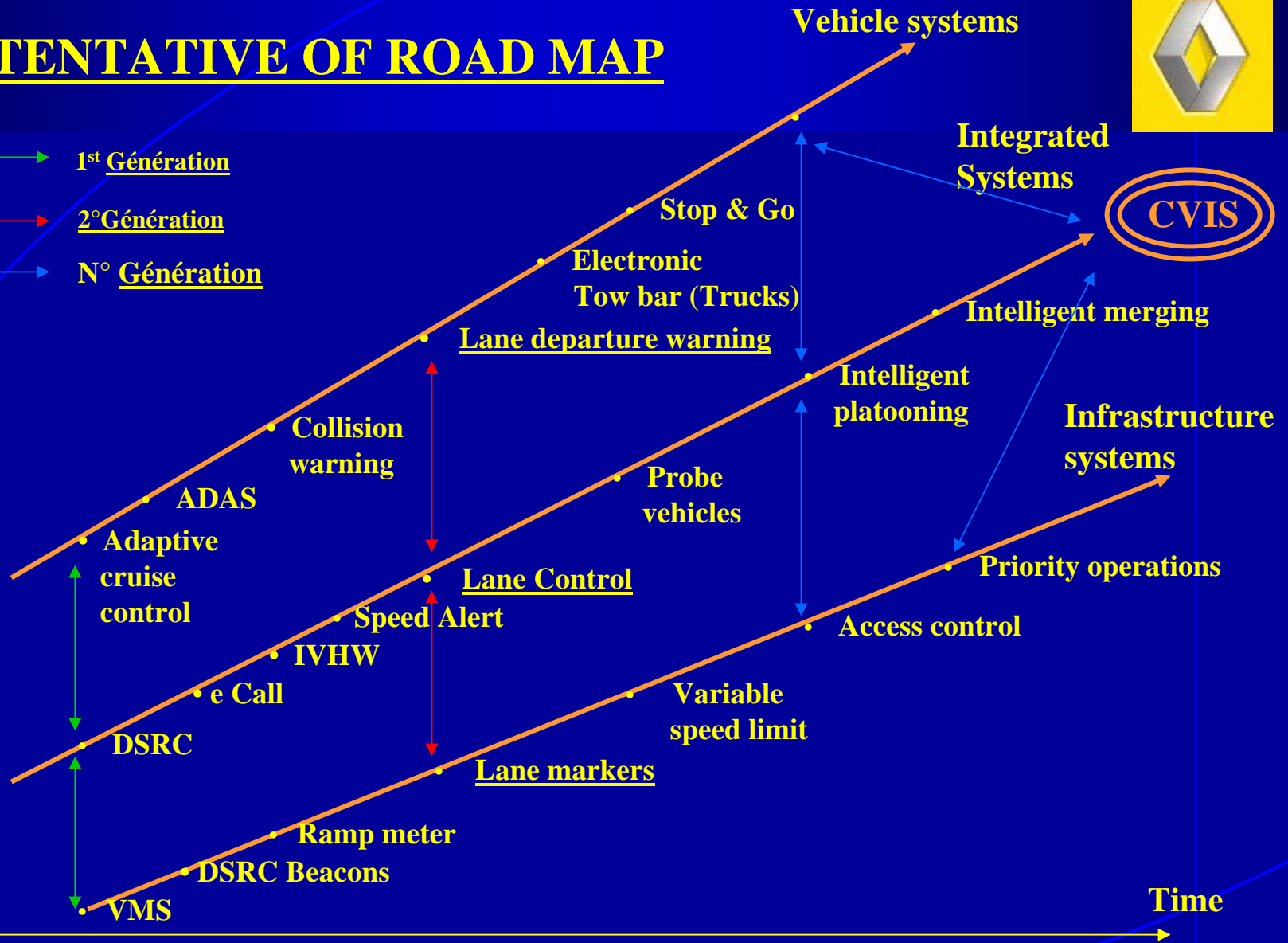
TENTATIVE OF ROAD MAP

→ 1st Génération

→ 2^o Génération

→ N^o Génération

Functions



* CO-OPERATIVE VEHICLE INFRASTRUCTURE SYSTEMS



**THANK YOU FOR YOUR
ATTENTION**

**AND I AM READY TO ANSWER YOUR
QUESTIONS**