

***"THE IMPACT OF A COOPERATIVE SYSTEMS ON ROAD OPERATORS:
TECHNOLOGY ASSESSMENT AS A TOOL FOR STRATEGIC
DEVELOPMENT"***

**THESIS PROPOSAL
WINTER SCHOOL 2013**

Tomé Pereira Canas – 2 December 2013

SUMMARY

Personal Presentation

Cooperative Systems

- Background
- Definition
- Examples
- Stakeholders
- Questions

Thesis Proposal

- Research Question
- Focus Statement
- Theme importance and implications
- Motivation
- Literature Review Areas
- Research Methods
- Structure
- Work plan
- Next Steps



PERSONAL PRESENTATION

Tomé Pereira de Matos Canas

Education

- Graduate Degree in Mechanical Engineering (IST)
- Master Degree in Engineering Design (IST)
- Postgraduate Degree in "Foresight, Strategy and Innovation" (ISEG)
- Business Management Program (AESE)

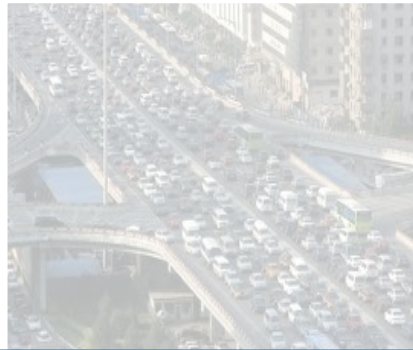
Works at Brisa since 2005

- Research and Innovation Manager at Brisa Innovation
- Scientific and research projects management
- Innovation system management, certified according to the NP4457 (Portuguese Innovation Standard)
- Ensure the scanning and foresight processes
- Intellectual property and technology transfer management
- Cooperation on new products design, especially on the mechanical engineering and industrial design

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COOPERATIVE SYSTEMS BACKGROUND



Cooperative Intelligent Transportation Systems (C-ITS)



Smartcities



**Mobile
technology**



**Investment
drop**

COOPERATIVE SYSTEMS DEFINITION

"Road operators, infrastructure, vehicles, their drivers and other road users will **cooperate to deliver the most efficient, safe, secure and comfortable journey**. The vehicle-vehicle and vehicle-infrastructure cooperative systems will contribute to these objectives **beyond the improvements achievable with stand-alone system**"

3rd eSafety Forum, 25 March 2004



COOPERATIVE SYSTEMS

EXAMPLES



Traffic Jam Warning

- The system detects a possible congestion, based on the speed and braking patterns of the cars and warns the drivers coming to the affected area of alternative routes, distributing the traffic load



Road Works Ahead

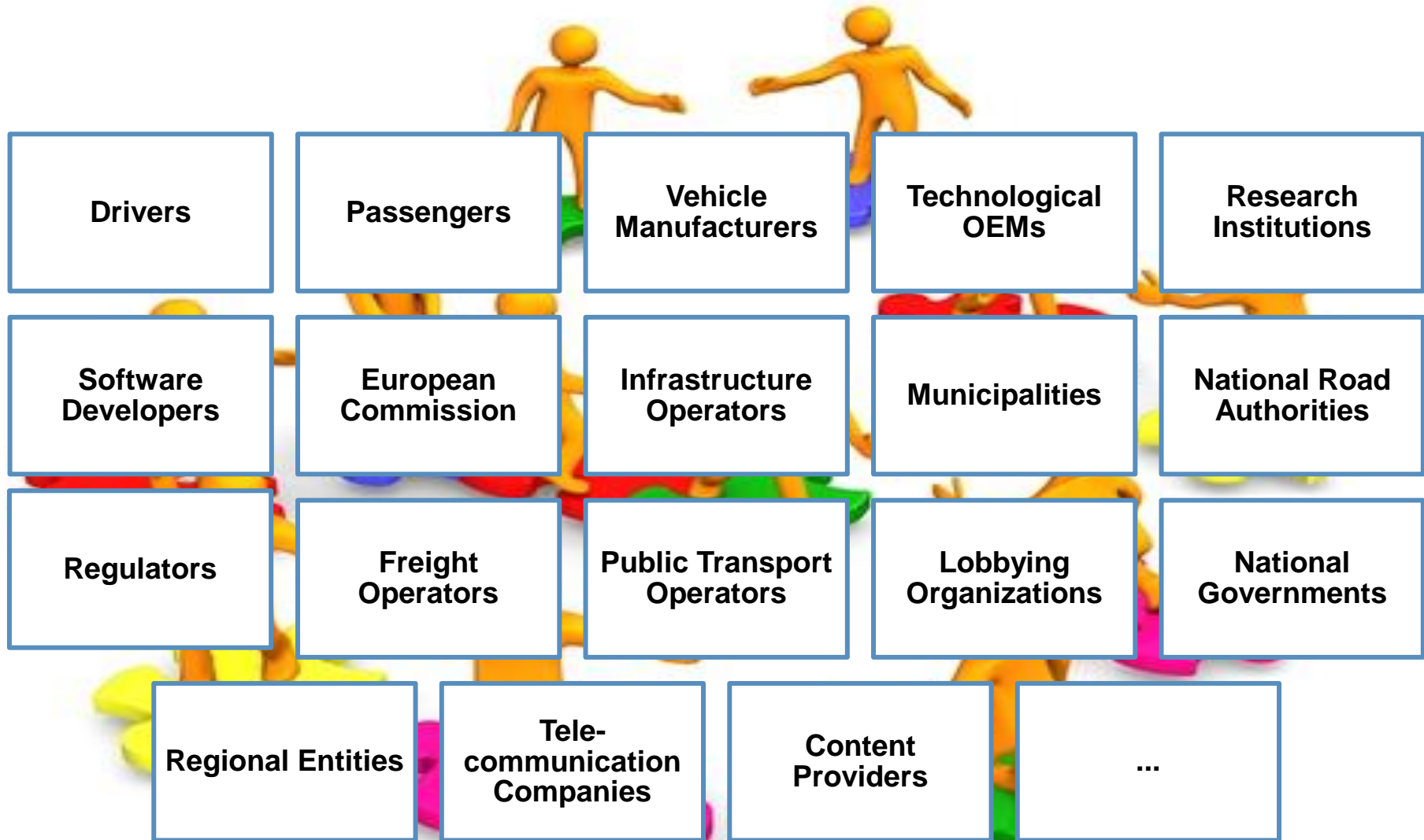
- The driver of a vehicle approaching is alerted by the “Road Works Ahead Warning”, so that they can adjust their route and driving speed in a timely manner



Wrong Way Warning

- Based on information from sensors on particular road hot-spots, the system notifies the driver on a wrong way situation of its immediate danger. Additionally, other drivers on the highway will be warned about an incoming wrong way vehicle, using infrastructure-to-car communications and variable message signs

COOPERATIVE SYSTEMS STAKEHOLDERS



COOPERATIVE SYSTEMS QUESTIONS

What are the advantages and impacts?

- What are the real advantages of the cooperative systems?
- Would it be possible to materialize these advantages using others types of systems?
- What problems/side effects may they bring?
- Questions of privacy for the users
- Who will pay the required investment?
- ...

What are the objectives and interests of the various stakeholders involved?

- Different interests and priorities among stakeholders:
 - Communication made only using vehicles: C2C vs C2X
 - Type of communication used: radio vs 3G/5G
 - Who will manage the global system?
 - Role of telecommunications companies
 - ...



THESIS FOCUS STATEMENT

The research and development of cooperative systems, regarding the cooperative communication between vehicles and between them and the infrastructure is a worldwide trend, as shown by the several research projects promoted by the European Commission, USDOT (U.S.) as well as Japan. There is an common understanding that these systems will have a positive contribution to road safety and traffic efficiency.

However, the assessment of the real impacts of these systems and their technology implementation strategies are not well known. In my thesis, I intend to assess said impacts among the various stakeholders, and in particular, on road operators, contributing to a better characterization of the research, development and implementation strategies of these systems.

THESIS OBJECTIVES

What are the impacts of cooperative systems?

- Assessment of cooperative systems: technological, social, political, environmental and economic impacts
- Technology challenges: positioning; communication reliability, etc
- Possible scenarios for the evolution of cooperative systems

How to reconcile the different interests of the stakeholders involved?

- Promoting collaboration among the stakeholders in a collaborative process of technological development (ecosystem), maximizing the positive and minimizing the negative impacts



THESIS

THEME IMPORTANCE AND IMPLICATIONS

European, American and Japanese research policies

- ITS Action Plan; Easyway program priorities (EU)
- Vehicle Infrastructure Integration – VII (USA)
- Advanced Safety Vehicle Program (Japan)

Range of objectives among the stakeholders

- Drivers, vehicle manufacturers, operators, municipalities, regulatory, government, etc..

Relevance for the road operators

- How will the cooperative systems influence road operators business and strategy? What threats or opportunities can they bring?



THESIS MOTIVATION

For myself

- Manager at the Department of Research and Innovation in Brisa Innovation, involved in several research projects related to cooperative systems
- Helping define R&D lines at medium and long-term
- Personal interest on research topics
- Following of "Foresight, Strategy and Innovation" post graduate course
- Contribute to technology assessment body of knowledge

For Brisa

- Understanding the role that an operator of road infrastructures will have on the new paradigm and the potential involvement of internal technology areas on the R&D process
- Bring the assessment methods and practices developed to Brisa



THESIS LITERATURE REVIEW AREAS

Cooperative Intelligent Transportation Systems:

- Technologies
- Trends
- Research lines and projects
- Likely impacts

Collaborative technology development:

- Open Innovation

Technology Assessment:

- Constructive Technology Assessment (CTA)
- Impact analysis (economic, societal, etc.)
- ...

Technological investment policies

- Infra-structure investment models

Prospective

- Stakeholder Analysis
- Foresight
- Scenarios

...

THESIS RESEARCH METHODS

**Stakeholder
analysis**

Brainstorming

Focus group

**Foresight:
scenario
development**

Case Study

THESIS STRUCTURE

Introduction

Literature Review

- Cooperative Systems
- Technology Assessment
- ...

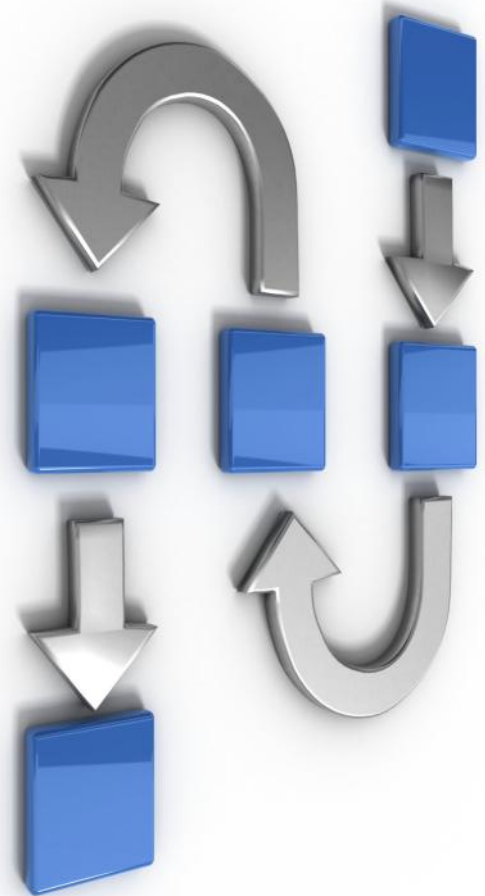
Research Methods

- Brainstroming
- Focus Group
- Foresigh

Case Study

- Use of research methods selected on a case study

Conclusions



THESIS NEXT STEPS

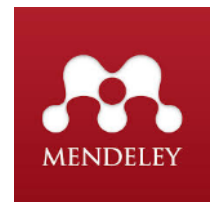
Continue the literature review

Identification of the stakeholders involved and their motivations

Research methods definition and planning

Information systems to be used during the thesis

Thesis Commission definition



Questions?