



IFSTTAR

French Institute of Science and Technology for Transport,  
Development and Networks

ITS for adaptive and  
resilient cities

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IFSTTAR

# Towards adaptive and resilient cities

- A urbanised future
  - Today, almost 80% of the population of Europe is living and working in urban agglomerations.
- European cities
  - Livable cities, Entrepreneurial Cities, Connected cities, Pioneer City, Fertile cities...
- Challenges and opportunities
  - Climate change
  - Sustainable energy systems
  - Vulnerability issues of Transport and communication infrastructures...
  - Ubiquitous sensing



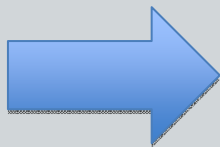
# Major European supported initiatives

- Europe 2020
- White paper on transport and STTP
- Smart Mobility
- Smart cities
- Urban Europe
- ITS directive sets several priorities :
  - Optimise the use of real time information services
  - Multimodal travel, traffic, road safety, secure parking
  - Cooperative systems & traffic management
  - Interoperable EU-wide eCall



# The European initiatives

- CIVITAS : City-VITAlity-Sustainability to promote and implement sustainable, clean and (energy) efficient urban transport measures
- Urban Europe (Joint Programming Initiative, June 2010)
  - sustain and enhance urban areas as a place of vitality, liveability and accessibility.
  - Taking advantage of emerging technologies, assessing their potential and socio-economic impacts, and utilizing them in new urban strategies.

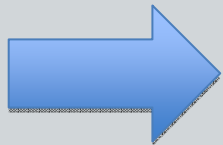


Transport and mobility are major stakes



# ITS for resilient and adaptive cities

- Through new and innovative services
  - On - line security systems for vehicles
  - Toll road initiatives & road pricing schemes:  
from 'Pay - as - you - drive' to 'Pay as you move'
  - Integrated vehicle or person navigation systems,
  - Preventive maintenance and warning systems...



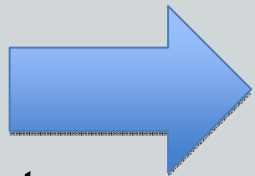
## Development constraints :

- Interoperable systems (For road, pedestrian ,...)
- Accessible for all
- Respecting equity and privacy



# IFSTTAR

- Created from the merge of INRETS (French Institute for Transport and Safety Research) and LCPC (French Civil Engineering Research institute)
- French State-owned research Institute under the authority of two ministries:
  - MESR: Ministry for Higher Education and Research
  - MEDDTL: Ministry of Ecology, Sustainable Development, Transport and Housing
- 1200 people (incl. 350 researchers and engineers and 250 PhD students) settled in 9 locations in France.

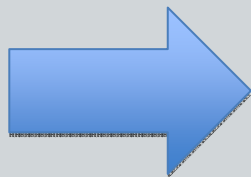


IFSTTAR research and expertise on city and future transport to improve the well-being of citizens.



# IFSTTAR competencies and field of studies

- Research, development and innovation activities
  - Urban engineering
  - Civil engineering and building materials
  - Natural hazards
  - Mobility of people and goods
  - Transport systems and means and transport safety
  - Infrastructure, their uses and their impacts
- Multidisciplinary approach:
  - Economic, Technology, Society, Health, Energy, Human Factors



Long term projects, empathy and creativity



# IFSTTAR is involved in long term projects

- European frameworks FP7 & associations
  - ECTRI, FEHRL, FERSI, OCDE-FIT, ERTRAC...
  - EU projects, COST, Marie-Curie, etc....
- Networks of excellence



Humanist

user centered design for ITS development

resilience engineering

safety management helping people cope with complexity  
under pressure to achieve success

[www.humanist-vce.eu/](http://www.humanist-vce.eu/)



cooperative systems for road traffic optimization

enhance road network efficiency and resilience

- sustainable & cooperative traffic management

[www.nearctis.org](http://www.nearctis.org)





# Ifsttar develops high end infrastructure

- From sensors...
  - Equipex Sense-city
    - Provide a test bed for nano sensors evaluation
    - 400m<sup>2</sup> reconfigurable climate room
- high level services
  - Equipex Claire-Siti
    - Next generation Traffic management centre
    - Integration of multimodal data
- To Electromobility services
  - Equipex PLIBAT
    - Test equipment to develop, evaluate and optimize systems combining photovoltaic electricity generation & energy management

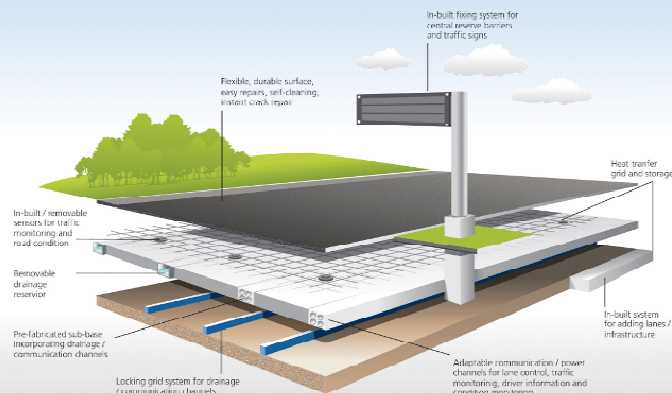


# and a broad range of ongoing research (1)

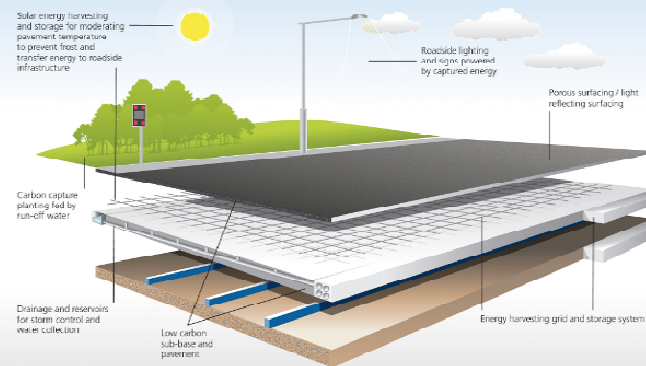
- In the scope of the **Forum of European National Highway Research Laboratories (FEHRL)**, Ifsttar acts to develop Forever Open Road, the 5th generation road



## The adaptable road



## The climate change resilient road



(Pictures courtesy of forever open road, <http://www.foreveropenroad.eu/>)



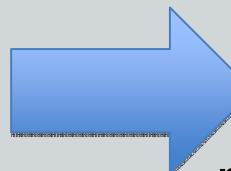
## ongoing research (2)

- Development of advanced driver/user assistance systems (HAVEit integrated project, Mobiville project...)
  - more sustainable and active lifestyle
  - improved environmental outcomes
  - improved land use planning and urban amenity
  - Development of pedestrian multimodal information
- Real time traffic information and management
  - Dynamic and cooperative traffic management
  - Multimodal route planner and tools towards electromobility



# How to improve research ?

- Catalyst 2MI Smart Multimodal Mobility signed by IFSTTAR (AMI Mobilités ADEME )
- Charter between 25 administrations&stakeholders
- Field experimentation, usage evaluation
- Economic & ecological progress
- ITS calls for communication, mutualization, interoperability

 Beyond research and demonstration, ITS have reached today deployment & innovation phases



# Conclusion

ITS dissemination will have to take legal organisational, economical aspects and user perspective into account.

- The integrated human centered multidisciplinary approach of Ifsttar is an asset and a catalyst





**IFSTTAR**

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Thank you for your attention

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