Institut français des sciences et technologies des transports, de l’aménagement et des réseaux
French Institute of science and technology for transport, development and networks

ようこそ
IFSTTAR’s short presentation

The French institute of science and technology for transport, development and networks was founded on January 1st, from a merger of the INRETS Institute and the LCPC Laboratory. This new entity enjoys the status of a public scientific and technological institution and is overseen by France’s ministry of ecology, sustainable development, transport and housing on one hand and the ministry of higher education and research on the other.

Recognised as a new reference organisation in the international arena, Ifsttar conducts applied research and expert appraisals in the fields of transport, infrastructure, natural hazards and urban issues, with the aim of improving the living conditions of France’s residents and, more broadly, promoting the sustainable development of our societies.

Key figures

- 1,250 employees
- 9 locations in France
- 25 research units
- 77 doctoral theses defended in 2010
- A budget of €120 M in 2011
- €15 M generated in revenue from research contracts
- 59 European projects in FP7
- 76 patents
- 21 software applications and 15 active licences
- 350 publications in international reviews in 2010
- 50 exceptional scientific facilities
Ifsttar’s missions

- Conduct, mandate, steer, assess... scientific works

- Research, developpement and innovation activities in the fields of
  - 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

- Considered from various angles:
  - Economics, Technology, Society, Health, Energy, Human
9 locations

- Grenoble
- Marseille Salon de Provence
- Nantes
- Paris
- Satory Versailles
- Marne la Vallée HQ
- Belfort
- Lyon Bron
- Lille-Villeneuve d'Ascq
Some outstanding facilities

- Geotechnical centrifuge & earthquake simulator
- Pavement fatigue carrousel and reference track for characterization of pavement surfaces
- Material mixing test facility
- Semi-anechoic room
- Structures laboratory and cable fatigue testing bench
- Magnetic Resonance Imaging device (MRI)
- Block Fall Test Facility
- Driving simulators
- Catapults
- Grenoble wheel
- Horizontal crash test facility
- Etc.
Ifsttar and its Japanese partners

• **Intense cooperation with several universities/institutes:**
  - Public works research institute - PWRI-(Tsukuba)
  - Japanese Ports and Airports Institute – PARI
  - Japanese Concrete Institute - JCI
  - Tokyo University
  - Kyoto University
  - Tohoku (Sendai) university (Pr Kuwahara)
  - Railways Transport Research institute (RTRI)
  - MLIT
  - JARI (Japan Automotive Research institute)
  - NILIM (National Institute for Land Infrastructure Management)
  - NTSEL (National Traffic Safety and Environment Laboratory)

• **Common workshops & projects**
  - Japanese-French ITS workshop (since 2002)/MLIT-NILIM
  - ECOSTAND/EUTRAIN European projects
  - EC-METI Task Force on Energy Efficiency
  - Common projects with Toyota
  - Contacts with Tokyo Metropolitan Expressway
  - Contacts with : NEXCO
Ifsttar and its Japanese partners: events 2012

- **EUTRAIN** European Project Regional Workshop, early September 2012 (to be detailed hereafter)
- **Workshop** between RTRI & SNCF, RFF, IFSTTAR organized under the auspices of the French Embassy, Tokyo September 2012
- **Symposium on reducing carbon footprint** between Kyoto University & IFSTTARR, Kyoto December 2012
- **CONCRACK Workshop** (JCI+IFSTTAR), Paris, March 15-16, 2012
EUTRAIN project - Basics features

A. EUTRAIN: 2 year project started on October 2011
   Funded by the EC FP7 program for a budget of 908 200 €
   Coordinated by
   with as partners

B. Objectives:
   1. Contribute to a framework for international transport research cooperation
   2. Identify countries’ research capabilities, investment, future RTD priorities and potential for cooperation with the EU in the prospect of mutual interest, in major regions of importance to the ERA in Transport (ERA-T)
   3. Consider and discuss current practices for research governance and management, barriers, gaps and diversions for international transport research cooperation
   4. Assess the benefits or added value to ERA-T and the prospective synergies from such closer international cooperation
   5. Investigate alternative cooperation models and tools
   6. Disseminate European know how and practices in transport research

C. 10 Worldwide targeted countries, Japan is one of them
Interactions with Japan

1. Answer to a **Survey** on “experiences in international Research cooperation incl. problems, difficulties and best practices” - ongoing ([http://www.eutrain-project.eu/questionnaire](http://www.eutrain-project.eu/questionnaire))

2. **Bilateral meeting** with Japanese ministerial representatives for face to face data extraction from survey – in preparation

3. **Regional workshop** to discuss cooperation between EU & Asia-Pacific (BRICS + Korea, Japan, Australia and Chile) regions – Beijing, China in September 2012
   → Interested to attend? Contact the coordinator

For **more information**, please:
- Contact the coordinator at [info@ectri.org](mailto:info@ectri.org)
- Visit the website: [www.eutrain-project.eu](http://www.eutrain-project.eu)
Urban form, mobility and segregation: keys for the future

1 – Global trends and challenges
   - Environment
   - Socio-spatial segregation

2 – Urban form, mobility and segregation: the case of French cities

3 – A sustainable urban form model? Keys for the future
1. Global trends and challenges

Mobility trends/research up to 2020

- Urbanization Impacting Mobility
- E-Mobility
- Mega and Smart Cities
- Microcars
- Car Sharing
- Sustainable Public Transportation
- Integrated Payment & Mobility Solutions
- New Urban Mobility Business Models
- High Speed Rail
- Geo-Socialization
- IT based Solutions
- Social Media Strategies
Main trends impacting urban mobility (cf Frost & Sullivan)

**MEGA CITY**
City With A Minimum Population Of 8 Million

**EXAMPLE:** Greater London

**MEGA REGIONS**
Cities Combining With Suburbs To Form Regions. (Population over 15 Million)

**EXAMPLE:** Johannesburg and Pretoria (forming “Jo-Toria”)

**MEGA CORRIDORS**
The Corridors Connecting Two Major Cities or Mega Regions

**EXAMPLE:** Hong Kong-Shenzhen-Guangzhou in China (Population 120 Million)
The urbanisation and mega trends that will shape tomorrow’s mobility and transportation needs
Urban Planning: Snapshot of a SMART Mega City Plan in 2020

SMART Buildings: At least 50% of buildings will be Green and Intelligent built with BIPV. 20% of the buildings will be Net Zero Buildings.


SMART Infrastructure: Multimodal Transport Hubs Providing Excellent Air, Rail, Road Connectivity to Other Mega Cities.

SMART Grid: Infrastructure to Enable Real-time monitoring of power flow and Provide Energy Surplus Back to the Grid.

SMART Energy: 20% of Energy Produced in the City will be Renewable (Wind, Solar etc).

Satellite Towns: Main City Centre will Merge with Several Satellite Towns to form ONE BIG MEGA CITY

SMART Cars: At least 10% of Cars will be Electric Vehicles. Free Fast Charging Stations at every half mile.

Source: Google Images
1. Global trends and challenges: environment

Road Transport has the Highest CO2 of all transport
1. **Global trends and challenges: environment**

**Car traffic in France since 1995**

![Graph showing car traffic in France from 1995 to 2008](image)

Source: Les Comptes des Transports en 2008 (MEEDDM-SOES) - 2009
1. Global trends and challenges: environment

Fuel consumption (billions m³)

Source: Les Comptes des Transports en 2008 (MEEDDM-SOES) - 2009
1. Global trends and challenges: environment

Other trends

- Growth of the number of cars
- Decrease in urban and suburban car traffic
- Growth of public transport offer
- Growth of public transport use: urban and suburban

Reasons of the traffic decrease?

- Economic situation and price of fuel
- Local public transport investments

Optimism for urban areas?
1. Global trends and challenges

JPI (EC Joint programming initiative) Urban Europe Presentation

**URBAN EUROPE – A Lens for Global Challenges**

The background of this Joint Programming Initiative (JPI) is the ongoing transformation of society, economy and environment. Globally, this is a transformation towards urbanisation. Hence, the future of Europe will largely be shaped in urban areas. It is here, where a series of global challenges and their impact on the social, economic and ecologic subsystems become concrete and must be managed. Major challenges to cope with are social deprivation and segregation, urban sprawl and congestion, environmental degradation and effects of climate change. European countries, wanting to be attractive places to live and work in a global village, should exploit the advantages of urbanised space.

**URBAN EUROPE – A Systemic and Innovative Approach**

The JPI URBAN EUROPE aims to develop innovative approaches to adequately address these challenges and create urban places of vitality, liveability and accessibility.
1. **Global trends and challenges**

**JPI (EC Joint programming initiative) Urban Europe key objectives**

- Understanding the dynamics inherent with urban systems and the implication of new grand challenges for urban systems and their development process
- Developing tools and instruments for the implementation of new urban policies on mid to long term urban development
- Assessing the contributions and impacts of emerging technologies and new governance solutions for the development of urban areas
1. Global trends and challenges: socio-spatial segregation

- Evolution of the dispersion of the average income of tax paying households per municipality between 1985 and 2004 for the fifteen largest French urban areas.

Calculs: LET-ENTPE, Louafi Bouzouina, 2006
1. Global trends and challenges: socio-spatial segregation

Accessibility inequalities to the city of Lyon

<table>
<thead>
<tr>
<th></th>
<th>Access time to a services basket</th>
<th>Motorized people %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IV</td>
<td>Public T.</td>
</tr>
<tr>
<td>Rich areas</td>
<td>10.5 minutes</td>
<td>35.6 minutes</td>
</tr>
<tr>
<td>Poor areas</td>
<td>10.3 minutes</td>
<td>32.2 minutes</td>
</tr>
</tbody>
</table>

Source: David Caubel, Thèse, 2006, LET

- Unequal access to car
- Access time with car: factor 3 with public transport
1. Global trends and challenges

How to improve urban sustainability?
A sustainable urban model? Polycentrism?

Empirical contradictory results about urban form and mobility

The question of sustainable urban area can not be reduced only to the environmental dimension…

Is there a urban form more sustainable than another? What about polycentrism?
2. Urban form, mobility and segregation: the case of French cities

Polycentrism and mobility

 Greater use of the car in subcenters

Example: polycentric urban areas in the Netherlands (Schwanen et al., 2001)

Counter-example: subcenters located near subway stations in Toronto (Pivo, 1993)

 Greater use of the car in subcenters

Examples: Atlanta (Sultana, 2000), San Francisco (Cervero et Wu, 1997)

 More contradictory results concerning commuting distances

Answer depending on the type of polycentrism (Schwanen et al., 2001) and the size of the city (Stead and Marshall, 2001)

Job-house imbalance increasing (environmental reasons, growing precariousness and unemployment...)

*It's not possible to conclude, it depends on polycentric characteristics* (Charron, 2007)
2. Urban form, mobility and segregation: the case of French cities

Comparison of French urban areas (Lille, Lyon, Marseille-Aix)

Analysis of the mobility (House locations, work locations, commuting distances) and socio-spatial segregation

Distances of commuting

<table>
<thead>
<tr>
<th></th>
<th>Lille</th>
<th>Lyon</th>
<th>Marseille</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Kms « all workers »</td>
<td>2898811</td>
<td>6415821,9</td>
<td>6748277,8</td>
</tr>
<tr>
<td>Total Kms « commuters »</td>
<td>2543743</td>
<td>5226223,0</td>
<td>3522605,2</td>
</tr>
<tr>
<td>% Kms commuters</td>
<td>87,8%</td>
<td>81,5%</td>
<td>52,2%</td>
</tr>
<tr>
<td>Average Distance (km)</td>
<td>7,6</td>
<td>10,1</td>
<td>13,6</td>
</tr>
<tr>
<td>Average Dist. « commuters »</td>
<td>9,9</td>
<td>13,0</td>
<td>21,0</td>
</tr>
<tr>
<td>Change 1990-1999</td>
<td>15 %</td>
<td>11 %</td>
<td>8 %</td>
</tr>
<tr>
<td>% by car</td>
<td>69 %</td>
<td>66 %</td>
<td>68%</td>
</tr>
</tbody>
</table>
The geography of commuting, distances and modes of transport

- Longer trips in Marseille area because of distant sub-centre
- Shorter trips in Lille because of proximity between centre and sub-centres
- Lack of public transport offer between sub-centres
2. Urban form, mobility and segregation: the case of French cities

Which links with urban forms?

- A real equilibrium at the sub-centre scale
- A relative proximity to sub-centres, also for people living out of sub-centres
- But, an increase of distances, due to the increasing number of longer trips (urban sprawl)
Urban forms, segregation and mobility: three types?

- Lyon: «an extended mono-centrism, with inequalities both apparent and diffuse»
- Marseille: «an “energy hungry” duo-centrism and doubly socially unequal»
- Lille: «an economical polycentrism, but socially unequal»
Lyon: “an extended mono-centrism, with inequalities both apparent and diffuse”

Here, subsidiary centres can be identified, but they do not in any way rival the principal centre, and in fact they simply extend its influence.

Dualism between rich districts in the centre and poor districts in suburbs is apparent, but territorial inequalities are also diffuses.

The development of secondary poles contributes to the growth of spatial and political influence of the centre.

But also to create islets attractive for richest households, and could be able to stop social specialization of urban areas.
Marseille : « an “energy hungry” duo-centrism and doubly socially unequal »

In the Marseille urban area there is a secondary centre which is of considerable importance, and which exercises a high degree of influence in the structuring of commuting with the centre. This model could be described as "energy-hungry", given that the large distance between the city centre and the secondary centre means that the average commuting distance is greater than in the other 2 urban areas, and that the car is the dominant means of transport.

- These two poles are also socially opposites. The town of Marseilles is divided in two parts, South and East rich districts, and poor districts only in the north of the town. In the second pole, Aix-en-Provence, households have high incomes in quite all districts.
2. Urban form, mobility and segregation: the case of French cities

- Lille: « an economical polycentrism, but socially unequal »

Here, several employment poles can be identified as, to some extent, rivals of the centre. They include the new town of Villeneuve d'Ascq, and their closeness to one another means that average commuting distances are shorter in Lille than in the other 2 urban areas.

- Great socio-spatial segregation: a “dual” territory, with rich districts and very poor districts, spatially located.
3. A sustainable urban form model? Keys for the future

- Organised polycentrism is potentially "economical" in terms of car traffic... if it means:
  - That employment poles structure their surrounding districts,
  - That commuting between different parts of an urban area is accompanied by a reduction in pollution through an increase in the use of public transport.

  *This obviously requires the implementation of appropriate planning policies*

- Does polycentric model develop or reduce segregation?
  There is no obvious answer,
  But, attractivity for richer households could be able to stop social specialization of urban areas and reduce socio-spatial segregation
3. A sustainable urban form model? Keys for the future

Which challenges and which degree of liberty at local level?

- Better to reduce non wished mobility than urban sprawl
- Is it possible to decouple urban sprawl and mobility?
- Towards an organized polycentrism?
- Be careful to socio-spatial consequences…
- Accept to lose time?
3. A sustainable urban form model? Keys for the future

➢ Be careful to socio-spatial consequences...

Mexico: an example of a «closed district»
3. A sustainable urban form model? Keys for the future

- Be careful to socio-spatial consequences…

Mexico: an example of a « closed district »
3. A sustainable urban form model? Keys for the future

Are we ready to lose time?

- Lose useless time: driving time
- Enhance the value of time spent in public transport
- Role of ICT (JPI Urban Europe)
- Role of transport policies: investments for public transport offer (quantity and quality) AND regulation for car traffic
3. A sustainable urban form model? Keys for the future

Thank you!
Thank you for your attention

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