Mobility Transport and Infrastructure

ON THE GREEN ROAD THANKS TO INTEGRATED INFORMATION HIGHWAYS AND MOBILE SERVICES

Jean Luc MATE
Vice president Continental Automotive France SAS
We Address the Mobility Megatrends

Safety
- Increased safety, comfort and convenience functions in the vehicle.
  - Chassis & Safety
  - Interior
  - Tires
  - ContiTech

Environment
- Shortage of natural resources. Sustained mobility.
  - Powertrain
  - Interior
  - Tires

Information
- Growing demand for information management in the vehicle and for improving mobility.
  - System Architecture
  - Connectivity

HMI
Transportation Systems Trends

- Traveller's
- Selected Mobility
- ITS
- Mobility operators
- Car sharing & intermodality
- optimised & interoperable infrastructure

Energy & Environnement
Major society trends

- **Digital life**
  - Web 2.0 Generation
  - Always on

- **Demographic change**
  - Aging society
  - Interculturalization

- **Health**
  - Pro-active health
  - Wellness

- **New values**
  - Convenience /Simplification
  - "Green" attitude

- **Urbanization**
  - New ways for mobility
  - Crime increase
The fundamentals for a durable green mobility

- always connected
- Low CO²

- Love Relation
- Health

- Money
- Safety

user centered expectations

Expectation during personal mobility
The world is changing ...

- Short range Communication
- Communication Long range
- Cameras
- Digital displays
- Text to speech & Voice recognition
- Search engines
- Location based services
- Security & Authentication
- Mass Storage
Megatrends relevant for Automotive Cockpit control

- Cost & Size
- Capacity & Speed
- Personal Smart phones as information carrier
- Content from servers
- Speed of new value proposals
- Intuitive, Nice, Simple Human Machine Interface

Speed of technology
« Always on »

- Continuous access to information
- Low CO²
- Love Relation
- Health
- Money
- Safety
- "0 Accident"
- Affordable
Continuous access to information

- Always on
- My communication Ecosystem network in mobility
- LBS Image & Video
- Navigation mobile phone & connectivity
- Radio

Time:
- 1950
- 2000
- 2005
- 2010
- 2020
Connectivity ICT in transportation

Always on

Smart phones…

Large screen

Speech

Téléphone

Navigation

car radio

embedded Automotive »

system cost
### Services in mobility everywhere everytime

<table>
<thead>
<tr>
<th>Connect Me</th>
<th>Guide Me</th>
<th>Entertain Me</th>
<th>Drive Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Stay Connected with Friends, Colleagues and the World</td>
<td>- Research, plan and download trip</td>
<td>- Stream Live and Time Shifted Content from the Internet, your Home, your Portable Device</td>
<td>- Vehicle Interaction</td>
</tr>
<tr>
<td>- Coordination Calendars</td>
<td>- navigate via connected search and traffic alerts Share experience</td>
<td></td>
<td>- Vehicle Data Access</td>
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<td>- Emergency Services &amp; Assistance</td>
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</table>

- Telephony
- SMS/E-Mail
- Calendar
- Aggregated Content
- Turn by Turn Navigation
- Points of Interest
- Location Based Services
- Traffic
- Music from CD/ DVD/USB
- Internet-Radio
- Web Services
- TV
- C2I, C2C
- Remote Diagnosis
- Dynamic Tolling
- Floating Car Data
- Pay As You Drive
- Eco Driving
Continuous access to information

Low Co²

Amour
Relation

Santé

Argent

Sécurité

Affordable

"0 accident"
« 0 accident »

- Passive safety
- Pre-crash detection
- Active safety
- Crash avoidance
- Rescue efficiency

Time: 1950 - 2020
Continous access to information

Low CO²

Love Relation

Health

Money

Safety

Affordable

"0 Accident"
CO2 emission/cars: focus on personal mobility in France (2007 data)

Car Emission per km (average) 172 (CO₂ g/km)

Mileage per people per year (average) 8 000 (km/year)

Nbr of People inside a car (average) 1,2

Car emissions per people per year 1,14 (t. of CO₂/year)
Data on Car transport: Relation between Speed and fuel/km

**Graph 4 - Consommation unitaire des VP en fonction de la vitesse**

- **Consommation unitaire** (L/100 km)
  - VP essence
  - VP diesel

**Graph 5 - Vitesse moyenne pratiquée par les VP sur l'ensemble des réseaux routiers**

- **Vitesse moyenne** (km/h)
  - 1993: 60
  - 1995: 62
  - 1997: 64
  - 1999: 66
  - 2001: 68
  - 2003: 70

**Source:** European Environment Agency

Sources: ONISR, calculs SES

### Evaluation of Mobility concepts on « Sustainable transport »

<table>
<thead>
<tr>
<th></th>
<th>France 2007</th>
<th>Engine Low CO²</th>
<th>Eco Driving</th>
<th>20% of E-CAR</th>
<th>Multi-mode</th>
<th>People per car</th>
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</thead>
<tbody>
<tr>
<td>Improvement ratio</td>
<td>-20%</td>
<td>-20%</td>
<td>-20%</td>
<td>-20%</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>Replacing mode efficiency</td>
<td>-20%</td>
<td>95%</td>
<td>75%</td>
<td>15%</td>
<td>16%</td>
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<td></td>
<td>172 g/km</td>
<td>138</td>
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<td>8 000 km/yr</td>
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<td>1,4</td>
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<tr>
<td></td>
<td>1,14 t. of CO₂</td>
<td>0,91</td>
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<td>0,92</td>
<td>0,97</td>
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<tr>
<td></td>
<td>0,97 t. of CO₂</td>
<td>94%</td>
<td>94%</td>
<td>95%</td>
<td>100%</td>
<td>101%</td>
</tr>
<tr>
<td></td>
<td>0,68 t. of CO₂</td>
<td>134%</td>
<td>134%</td>
<td>136%</td>
<td>143%</td>
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<tr>
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<td>0,24 t. of CO₂</td>
<td>376%</td>
<td>376%</td>
<td>381%</td>
<td>400%</td>
<td>406%</td>
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- 2012: 0,97 t. of CO₂ (94% reduction)
- 2020: 0,68 t. of CO₂ (134% reduction)
- 2050: 0,24 t. of CO₂ (376% reduction)

**Kyoto**

- (*) electricity used is generated with "CO2-free" sources (-95%).
- (**) CO2 emissions are reduced by 75% with the alternative mode (bus, trains in UK).
- (***) limit also traffic jam, with same nbr of people transported by car.
« 0 émissions »

- **0 emission**
- **Green Mobile Services & % E-Véhicules**
- **Low CO² conventional & hybrids**
- **Euro 4, 5, 6…**

Time:
- 1950
- 2000
- 2005
- 2010
- 2020
From Low $\text{CO}_2$ to "O emission"

- Services for green mobility
- Turbocharging
- Hybrid
- Postprocessing
- Euro 4,5,6
- E vehicle + Li ion
- Embedded solutions

System cost
eco ROUTE™ help drivers save fuel and money

- eco ROUTE suggests fuel-efficient navigation to any destination
- ecoROUTE provides a Fuel Report and Mileage Report to track usage over time and per trip
- eco ROUTE offers a Driving Challenge that helps drivers improve driving habits and increase fuel efficiency
Use of vehicle engine data provides real fuel economy to display and build routing data as well as display the real driving style for improvement.
iPhone app  ECO driver: example of warning reporting
iPhone app  ECO driver: example of performance reporting
In city Vehicle Parking Detection with courtesy of LIBERTA

- An infrastructure on the ground within the city allows vehicle parking recognition, its precise location and its identification.
- Technology issued from French Nationnal Space Center
- A city information system allowing customers to know all available parking spaces on public streets.
- A communication between City operators and customers through mobile phones and/or lap tops allowing automatic payment of parking fees.
An upgrade of existing infrastructure!
Green Infrastructure with Energy Recovery

About

The pavegen slab moves under 5mm from each footstep. It converts the kinetic energy to electricity that is stored within the slab.
Major Steps to change the world of Mobility

• Extend living labs concepts to complete new cities under construction

• Create system engineering teams with all processes, methods and tools to optimize system architecture under Design constraints.

• Educate Develop and Mature:
  • System Architects
  • System Designer
  • System integrator
  • System innovators
They will design our future: We need to encourage them.

The Young European Arena of Research 2010 is a competition for early-stage researchers who are exploring the area of surface transport within their research. The competition will give the students an opportunity to showcase their work to experts within the field, both on the web and, for the best applicants, at the Transport Research Arena conference, TRA2010 in Brussels in June 2010.