SMART SUSTAINABLE Mobility: from research to practice

Dr. Georgia Ayfadopoulou
Principal Researcher Hellenic Institute of Transport Centre of Research & Technology Hellas
Email: gea@certh.gr
Tel: 2310 498451, 2310 498457
Web: www.hit.certh.gr
Structure of Presentation

- Smart Sustainable mobility: What is it?
- ITS: where do we stand today?
- ITS: what we need for the future?
- HIT ITS test bed & mobility living lab
Smart Sustainable mobility: What is it?

- Technology supporting «seamless accessibility» to
  - transport infrastructure & services
  - Change of modes (intermodality)
- For all
  - Passengers (inclusive transport) &
  - Freight (smart cargo)
- Reducing impact to environment through
  - Better chain/mobility management (transport demand management),
  - Infrastructure & services “optimization”, (supply management)
  - User behavior change
Smart Sustainable mobility: What is it?

- Intelligent Transport systems implementation for
  - Efficient Operation
  - Reduced environmental impact
  - User Facilitation & behavior change in transport infrastructure & services
  - Safe & secured transport achievement
  - Rational maintenance and operational cost

System of Systems

Internet of things

Multidisciplinary approach
ITS: Where do we stand today?

- Smart vehicle & infrastructure management (available)
- Cooperative ITS: vehicle - infrastructure communication
- Connected ITS systems (in future)
- Mobility as a service - connected user
ITS: Where do we stand today?

• ITS Directive sets the framework
• Cooperation schemes exist, while new ones emerge to bridge the gap created due to new business models required, new technological improvements etc
• Role of ITS associations (National ITS associations, ERTICO, ITS Nationals...)
• Huge technological advances
  ▫ Large experience from research activities
  ▫ Connected vehicles and infrastructures
  ▫ User aware traffic management (eg TM20)
  ▫ Efforts to accelerate large scale deployment
• Governments under economic pressure: less public spending
• Energy & fuel sector largely influenced by external parameters
• Banking sector seeks opportunities in “green business”
• Private sector is changing, with large IT companies seeking for a change in their market products and SMEs creating innovative solutions
• Citizens (end users) are already used to tech products assisting them in everyday life
ITS & innovation: What we need in future

- To define all (new) players
- To enhance dialogue among all
- To coordinate isolated initiatives
- To define new cooperation schemes
- To accelerate innovation
- To capitalize results
- To improve mobility for all by making ITS part of everyday life
- To support policy objectives
ITS & innovation: What we need in future

- **Scientific**
  - Need for multi-disciplinary ITS education
  - Need for proven impact/benefits assessment
  - Content management – big public data

- **Design**
  - Harmonization and interoperability
  - National ITS architectures and commonly agreed standards

- **Deployment**
  - Cooperation between all stakeholders
  - ITS in Smart Cities & ITS Corridors

- **Policy**
  - In line with EC ITS Directive 2010/40/EC
  - Creation of tools that will enable the monitoring of ITS deployment in Europe, incl. national assessment bodies and national access points

- **Industry**
  - Interoperable and open solutions
  - Cooperation between the “giants” and the “new players”

- **Marketing**
  - Increase user awareness
  - Provision of services that tackle actual problems of end users
ITS Test bed & smart mobility living lab: objectives

- **Public stakeholders**
  - Support technology uptake
    - proof of concept
    - Decision theater
  - Technical Assistance for large scale ITS implementations & integrations
  - Interoperability checks
  - New low cost technologies integration
  - Know how transfer

- **Business & technology industry**
  - New product ideas
  - New products testing & enhancement

- **Society**
  - New mobility supporting services
  - User behavioral analysis
  - Users training to new services
ITS Test bed & smart mobility living lab

Public Transport management

Traffic Control Center

Floating Car Data

Cooperative ITS

User

Mobility Management Center

smart mobility living lab
ITS Test bed & smart mobility living lab

- **Hardware:**
  - Own network of 45 point-to-point travel time detectors
  - Own network of cooperative mobility components
  - Servers connected to TMC with real-time traffic information for Thessaloniki and Athens
  - Workstations (HIT-Portal)

- **Software:**
  - Transportation planning tools
  - Simulation tools
  - Dynamic traffic assignment tools
  - Optimization and mathematical programming
  - Statistical analysis tools
  - GIS tools

- **Data**
  - Mobility & Traffic
  - Floating data
  - Social media
Simulation of transport systems and networks

- Microscopic simulation of traffic flow
- Cooperative mobility systems simulation
ITS Test bed & smart mobility living lab

Technology Interoperability support

SIEMENS

swarco

Delcan
Optimization of transport systems and networks

- Multi-criteria route choice
- Route planning
- Traffic signals
Travel demand forecasting and supply management

- Traffic assignment models
- Dynamic traffic assignment models
- Traffic signals management
ITS Test bed & smart mobility living lab

Statistical analyses and mobility indicators

- Statistical methods for real-time traffic prediction
- Historical data analysis
- Indicators / Dashboards
Transport related data/content management

- Multi-source content management
- Data fusion (HIT content aggregator)
  - Traditional traffic measuring sensors
  - Point-to-point detectors
  - Floating car data
  - User/crowd created content
Intelligent Transport Systems - ITS

- Integrated systems for transport systems management (EOX DTA architecture)
- Cooperative ITS
Insight into cooperative ITS logic

ITS Test bed & smart mobility living lab
ITS Test bed & smart mobility living lab

Services to users - mobile applications
Dynamic traffic forecasting
Ενδεχόμενως να υπάρξουν διαφορές από τα αποτελέσματα του χάρτη λόγω κατασκευαστικών έργων, ανθεκτικής κυκλοφορίας, καταρρευσιν ή άλλων παραγόντων. Ωστόσο θα πρέπει να προσεχτεί την διαδρομή σας κατάλληλα. Πρέπει να υποκύψετε σε όλα τα σημεία της περιβαλλοντικής που αναφέρονται στην διαδρομή σας.
Location based services

http://www.easy-trip.gr
http://www.easytripdata.imet.gr
European Innovation Partnership Smart Cities & Communities

H2020: SMART CITIES LIGHTHOUSES

Impact
Team work!
Thank you for your attention!

Dr. Georgia Ayfadopoulou
Principal Researcher Hellenic Institute of Transport
Centre of Research & Technology Hellas
Email: gea@certh.gr
Tel: 2310 498451, 2310 498457
Web: www.hit.certh.gr