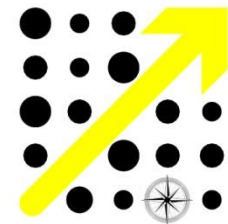




SMART SUSTAINABLE Mobility: *from research to practice*

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



thessaloniki **thesmart mobility** week

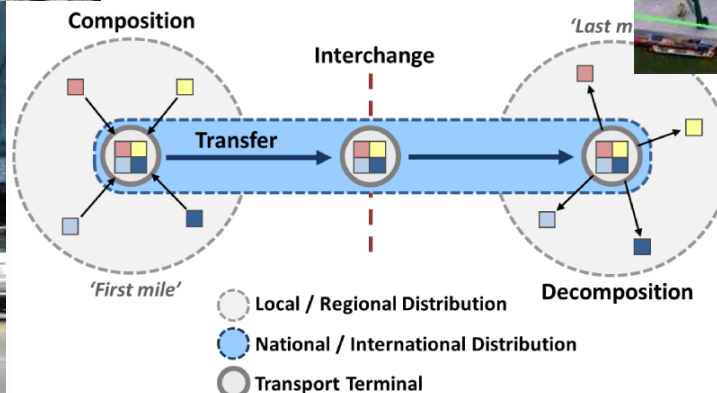
the FUTURE of 

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?

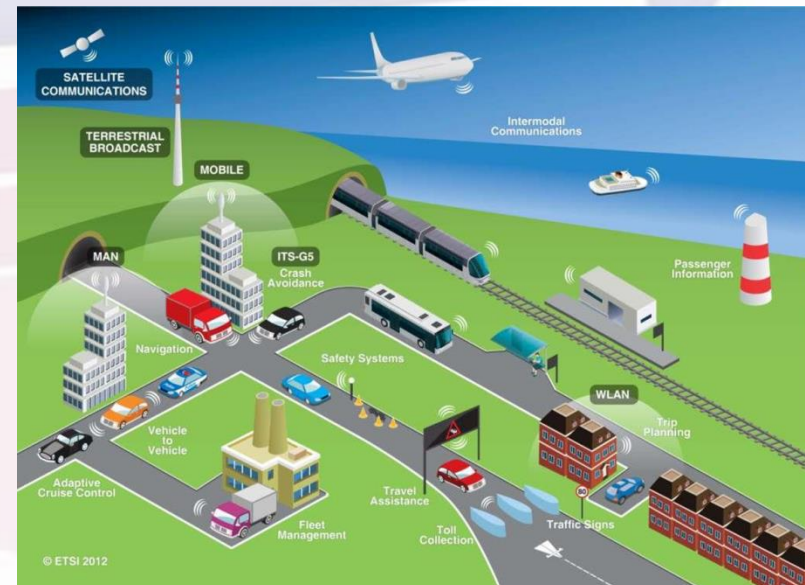
▫ *Intelligent Transport systems implementation for*

- *Efficient Operation*
- *Reduced environmental impact*
- *User Facilitation & behavior change in transport infrastructure & services*
- *Safe & secured transport achievement*
- *Rational maintenance and operational cost*

Multidisciplinary approach

System of Systems

Internet of things



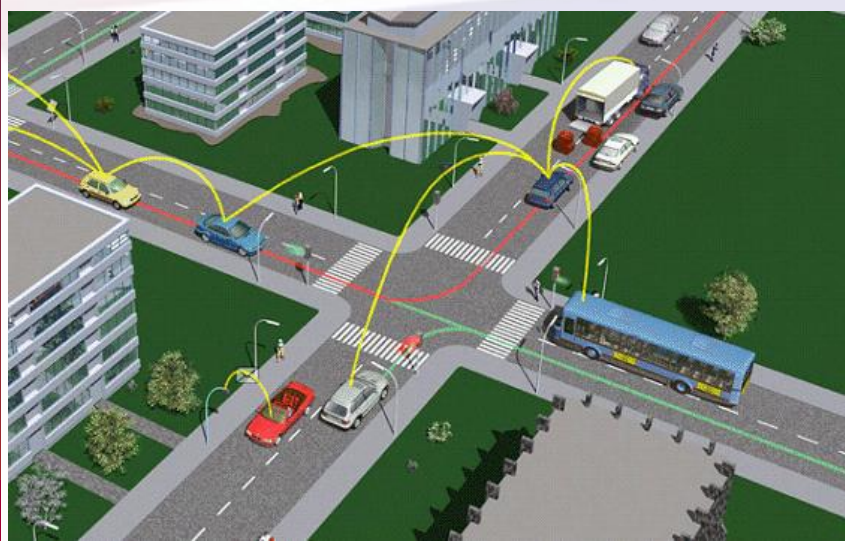
ITS: Where do we stand today?



Smart vehicle & infrastructure management (available)



Connected ITS systems (in future)



**Cooperative ITS :
vehicle - infrastructure communication**



**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*

ITS: Where do we stand today?

- *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**

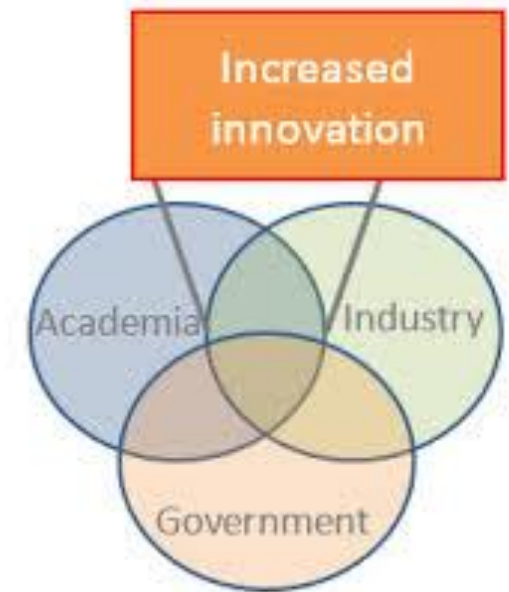
- Support technology uptake
 - **proof of concept**
 - **Decision theater**
- Technical Assistance for large scale ITS implementations & integrations
- Interoperability checks
- New low cost technologies integration
- Know how transfer

- **Business & technology industry**

- new product ideas
- New products testing & enhancement

- **Society**

- New mobility supporting services
- User behavioral analysis
- Users training to new services



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Public Transport management



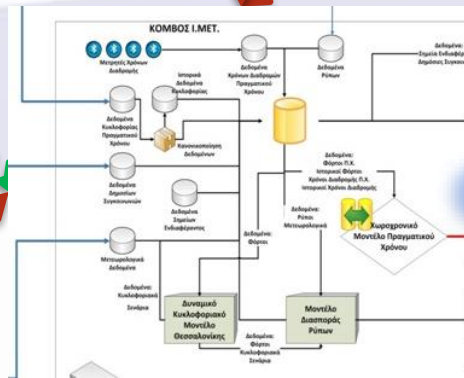
Floating Car Data



Cooperative ITS



Traffic Control Center



User



Mobility Management Center

smart mobility living lab

ITS Test bed & smart mobility living lab

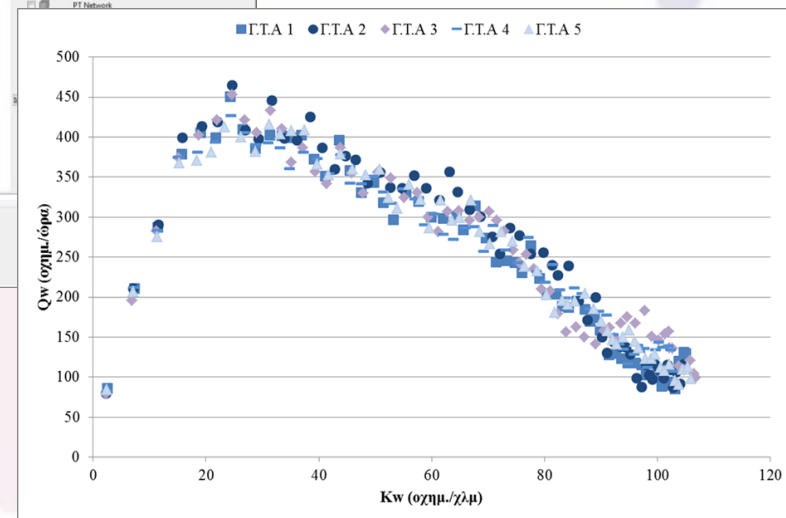
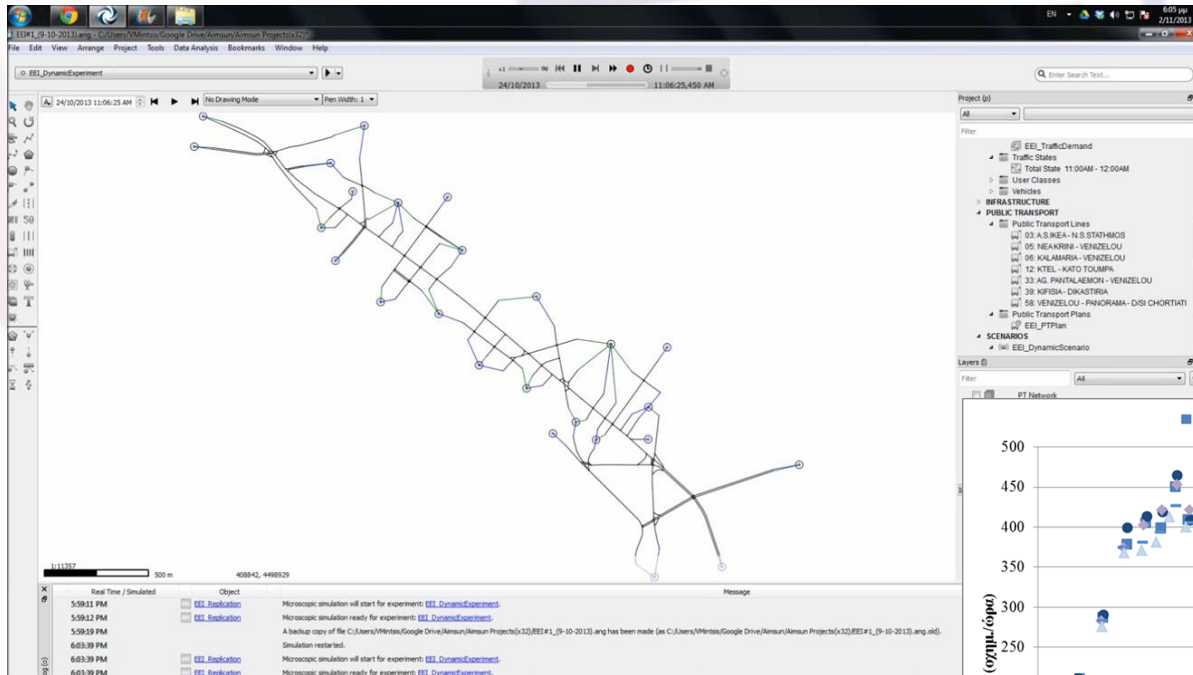
- Hardware:
 - Own network of 45 point-to-point travel time detectors
 - Own network of cooperative mobility components
 - Servers connected to TMC with real-time traffic information for Thessaloniki and Athens
 - Workstations (HIT-Portal)
- Software:
 - Transportation planning tools
 - Simulation tools
 - Dynamic traffic assignment tools
 - Optimization and mathematical programming
 - Statistical analysis tools
 - GIS tools
- Data
 - Mobility & Traffic
 - Floating data
 - Social media



ITS Test bed & smart mobility living lab

Simulation of transport systems and networks

- Micro-scopic simulation of traffic flow
- Cooperative mobility systems simulation



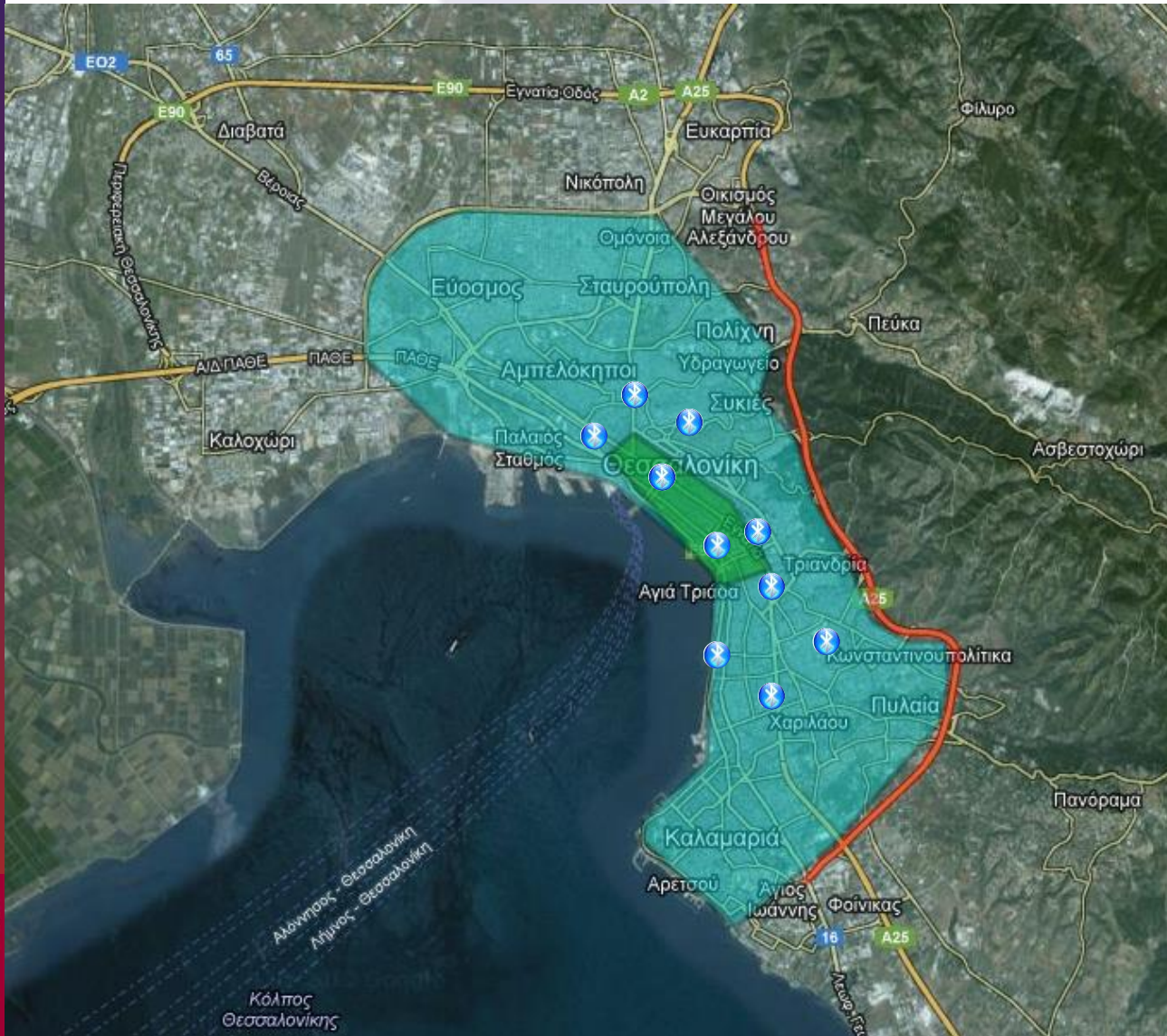
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Technology Interoperability support

SIEMENS

swarco

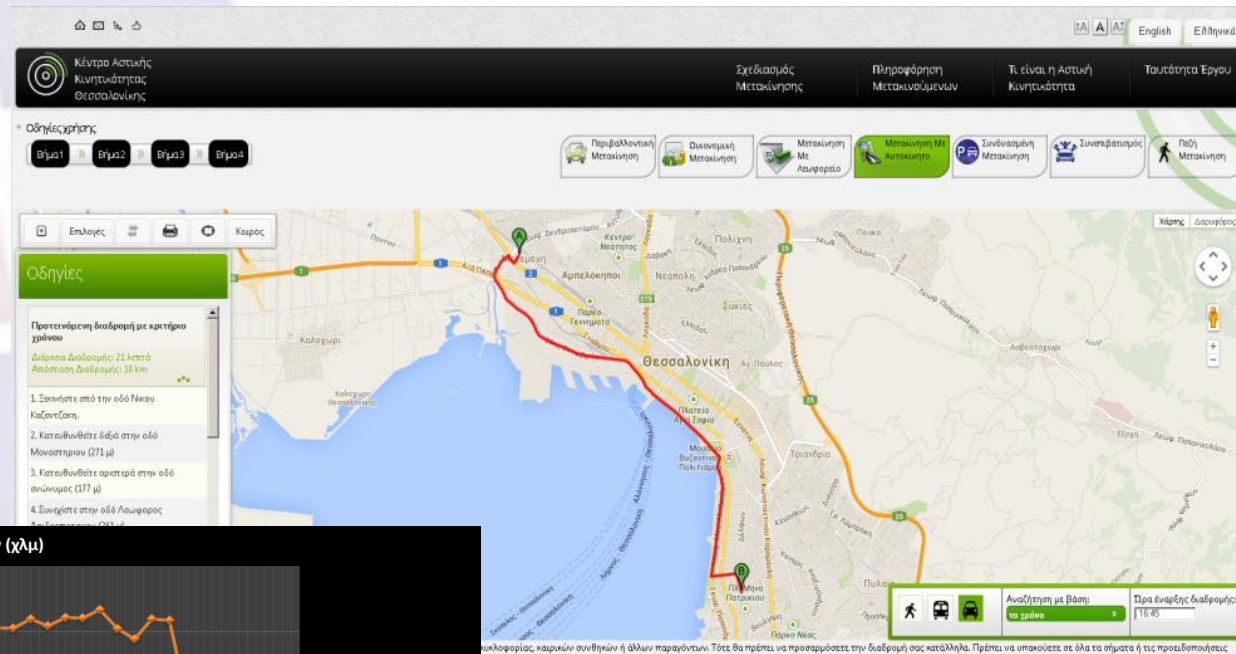
Delcan
TRANSPORTATION • INFORMATION TECHNOLOGY • WATER



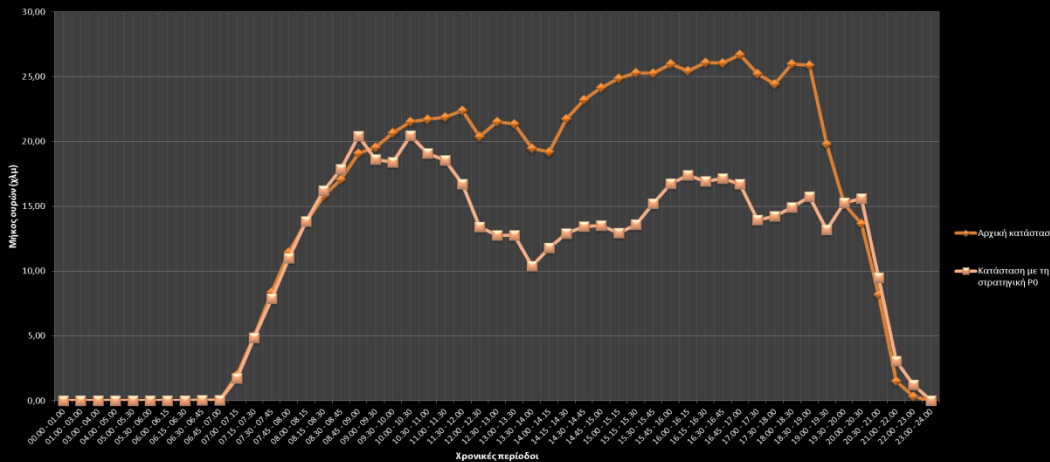
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Optimization of transport systems and networks

- Multi-criteria route choice
- Route planning
- Traffic signals



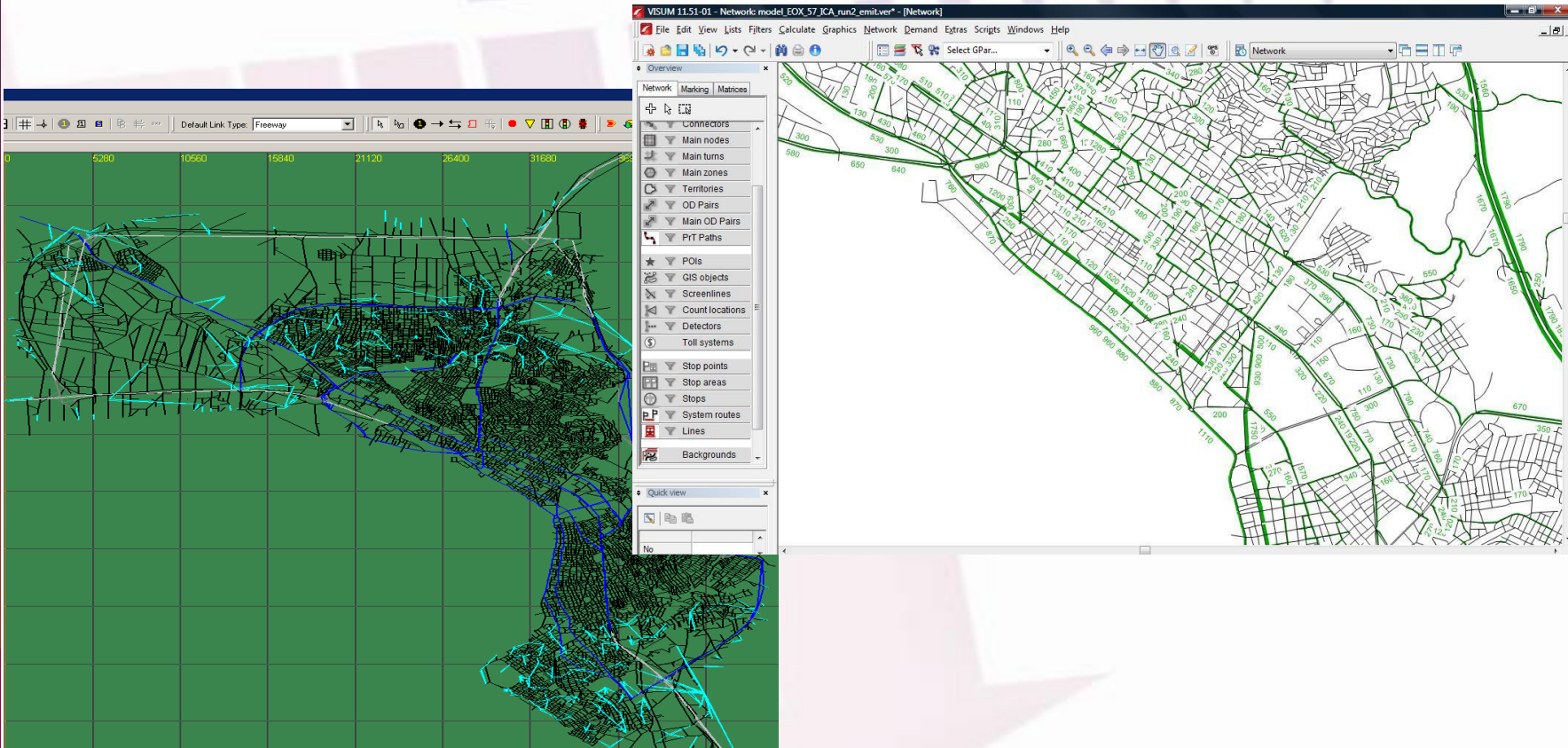
Διακύμανση μήκους ουρών (χλμ)



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Travel demand forecasting and supply management

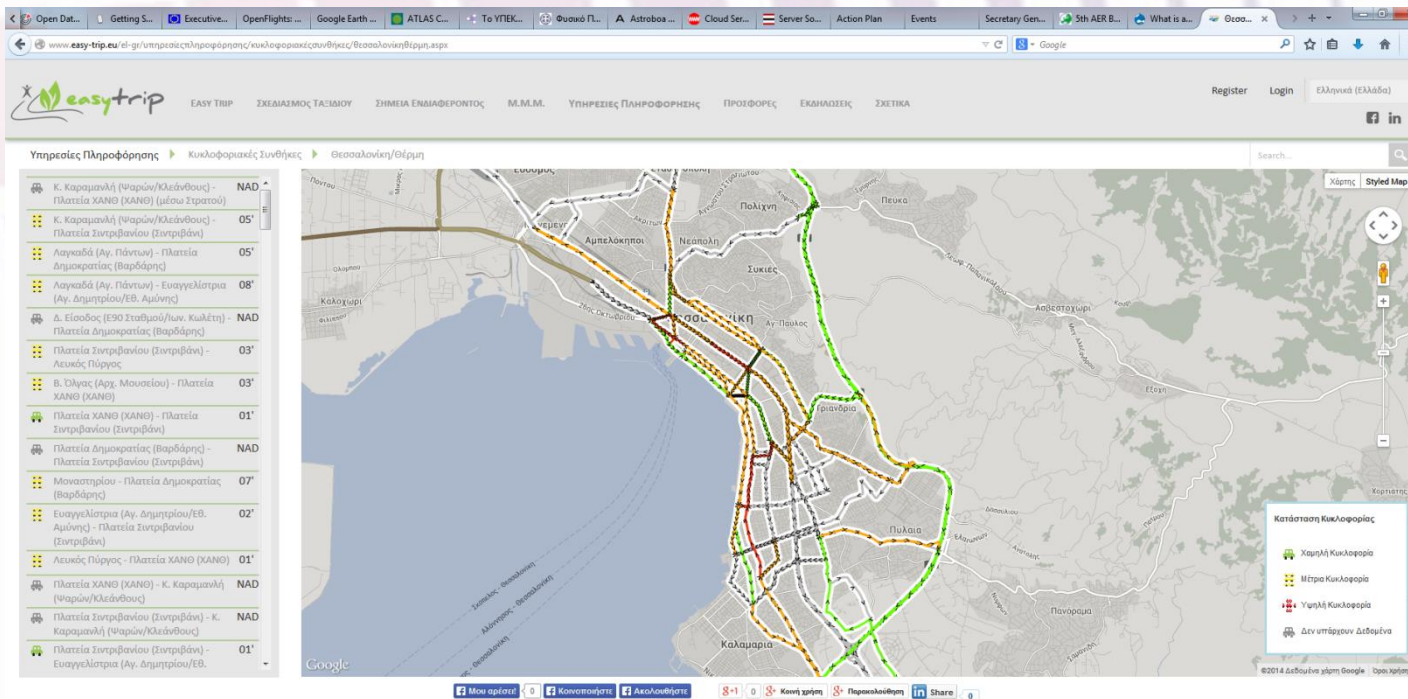
- Traffic assignment models
- Dynamic traffic assignment models
- Traffic signals management



ITS Test bed & smart mobility living lab

Statistical analyses and mobility indicators

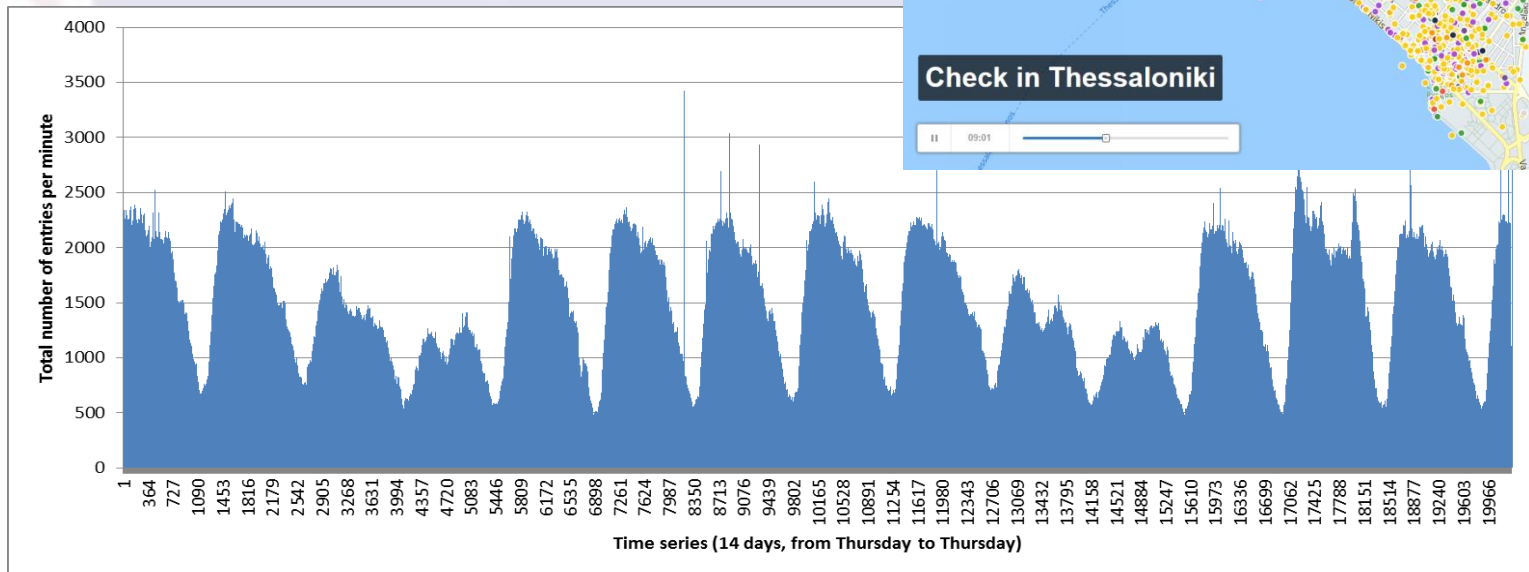
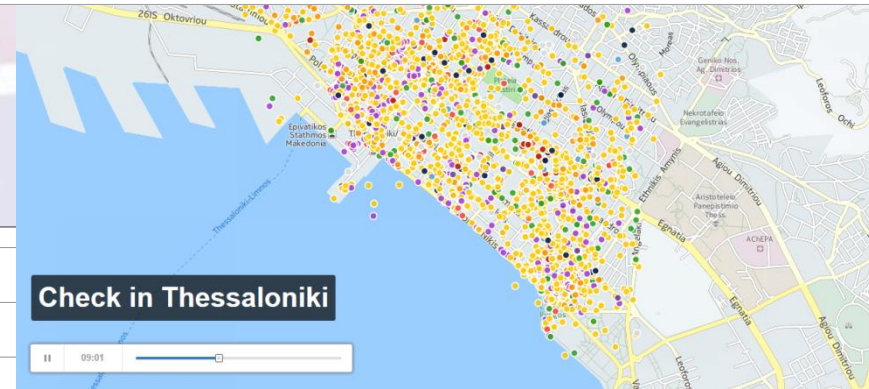
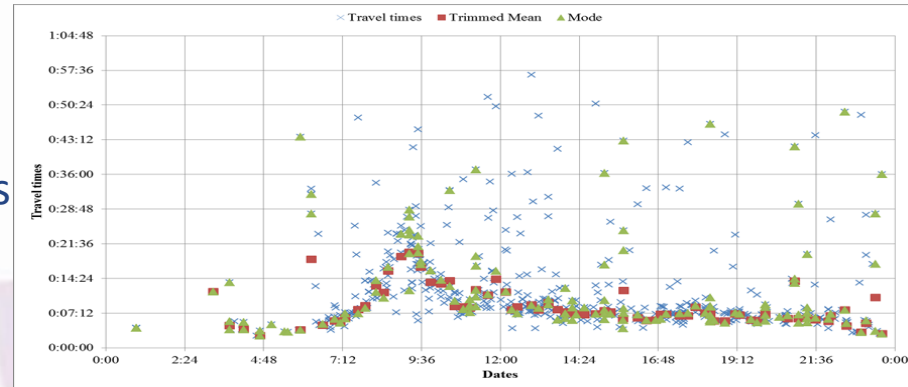
- Statistical methods for real-time traffic prediction
- Historical data analysis
- Indicators / Dashboards



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Transport related data/content management

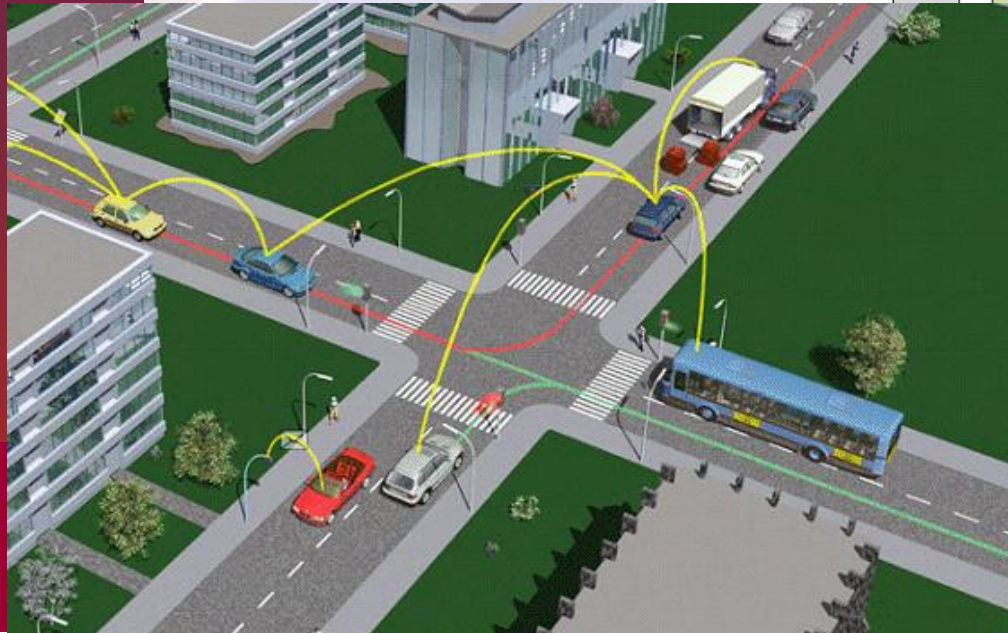
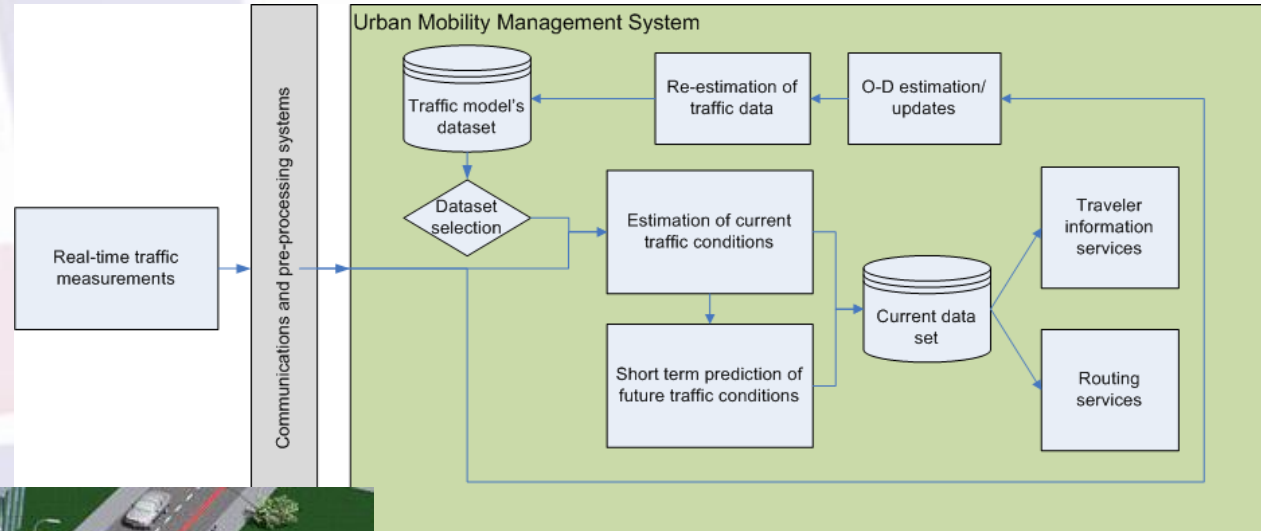
- Multi-source content management
- Data fusion (HIT content aggregator)
 - Traditional traffic measuring sensors
 - Point-to-point detectors
 - Floating car data
 - User/crowd created content



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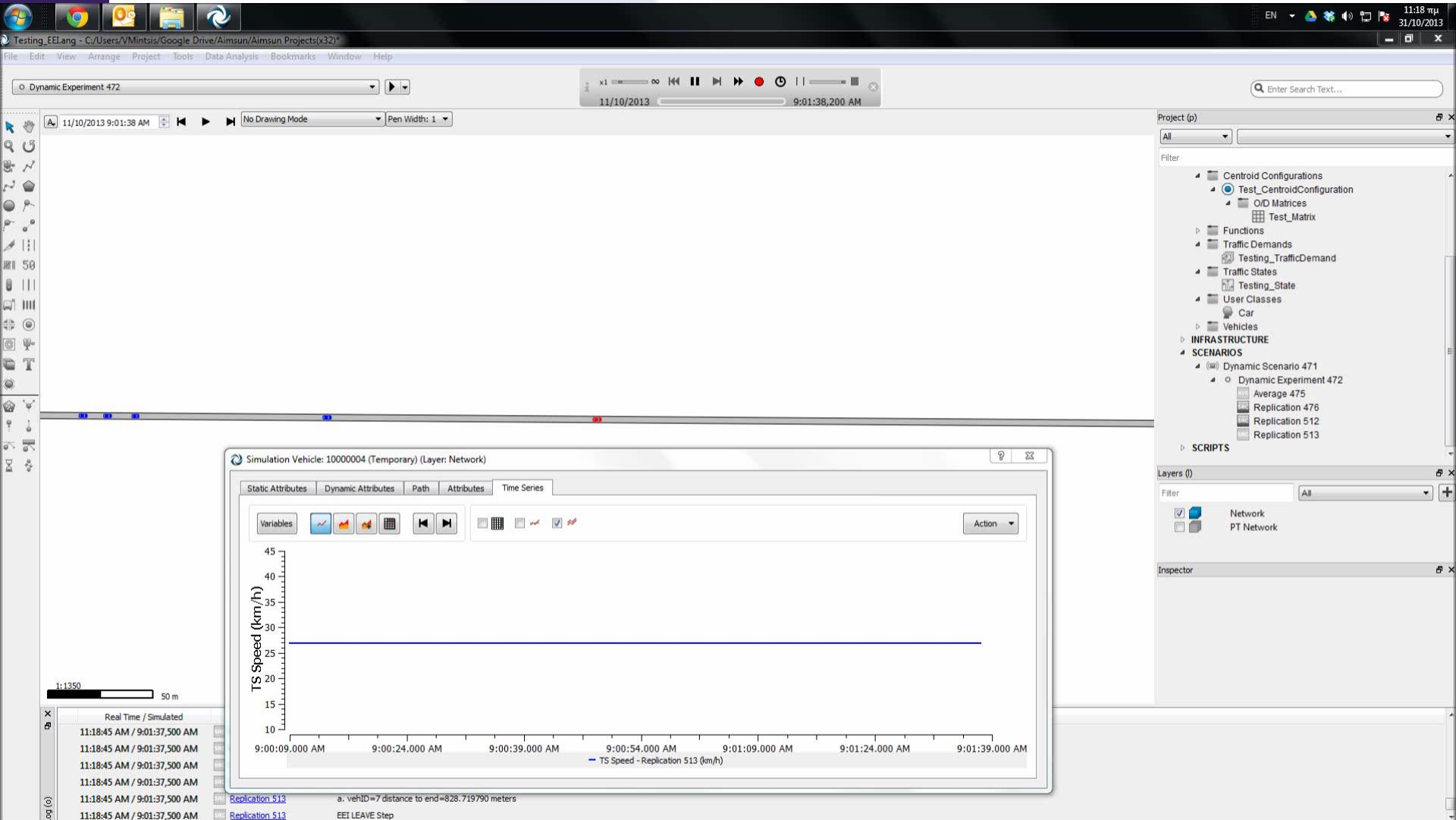
Intelligent Transport Systems - ITS

- Integrated systems for transport systems management (EOX DTA architecture)
- Cooperative ITS



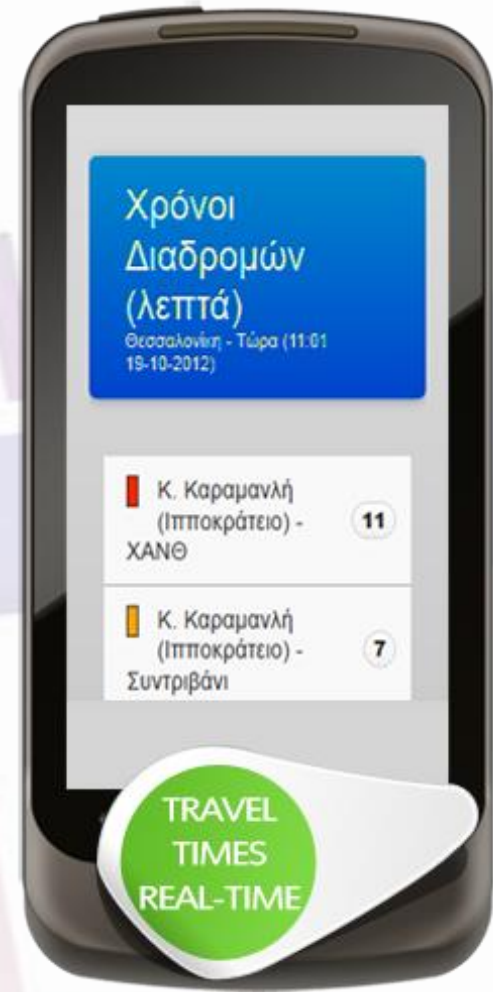
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Insight into cooperative ITS logic

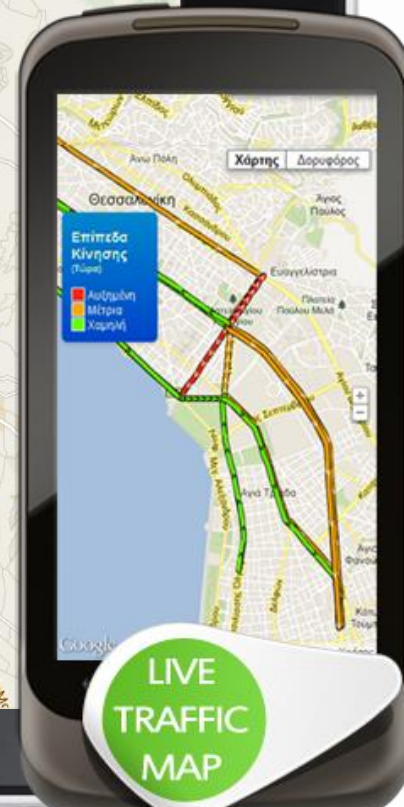
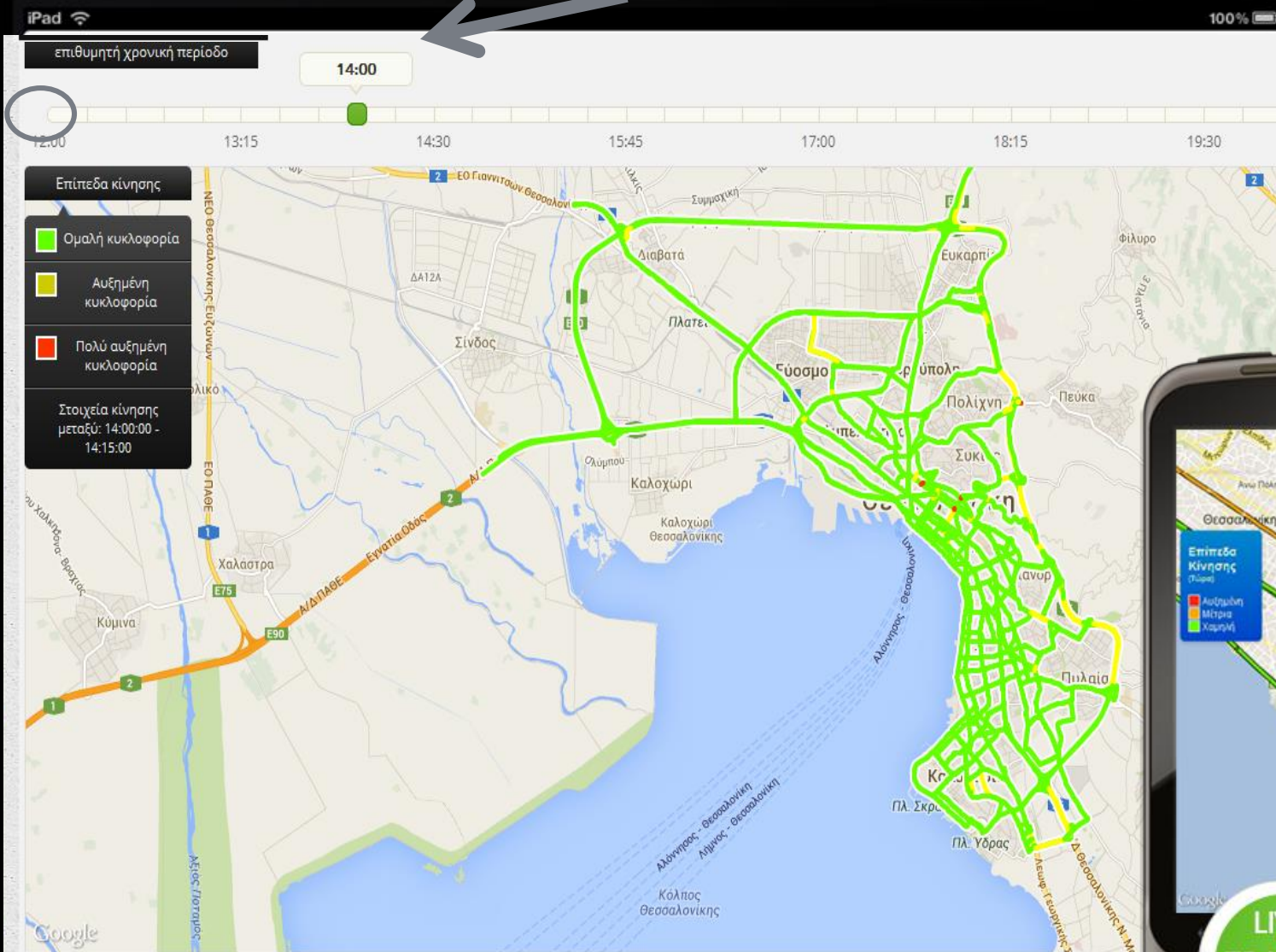


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Services to users - mobile applications



Dynamic traffic forecasting



- Πως λειτουργεί:
Πατήστε εδώ για μια σύντομη παρουσίαση!
- Οδηγίες χρήσης

Βήμα 1 >> Βήμα 2 >> Βήμα 3 >> Βήμα 4

Περιβαλλοντική Μετακίνηση
Οικονομική Μετακίνηση
Μετακίνηση Με Λεωφορείο
Μετακίνηση Με Αυτοκίνητο
Συνδυασμένη Μετακίνηση
Συνοπτιβατισμός
Πεζή Μετακίνηση

Επιλογές Καιρός

Οδηγίες

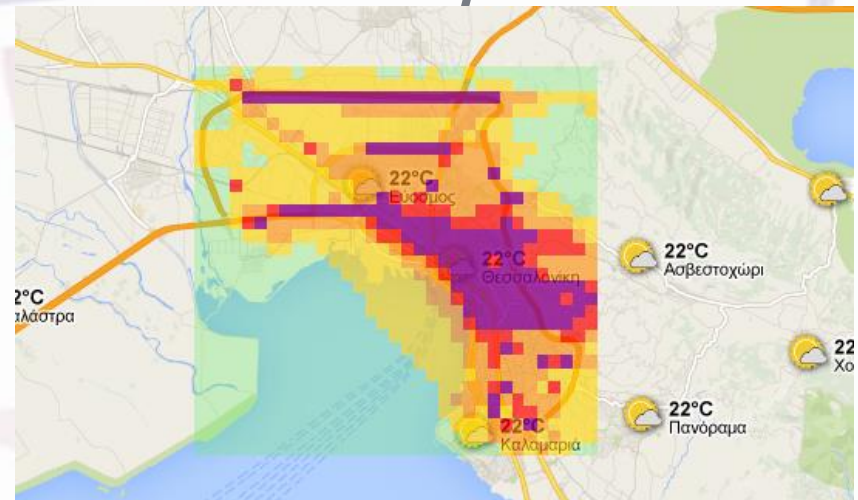
Προτεινόμενη διαδρομή με περιβαλλοντικά κριτήρια
Απόσταση Διαδρομής: 22 km

1. Ξεκινήστε από την οδό ανώνυμος.
2. Συνεχίστε ελαφρώς δεξιά στην οδό Προς Αθήνα (1734 μ)
3. Συνεχίστε ελαφρώς δεξιά στην οδό Θεσσαλονίκης-Μαλγαρών (130 μ)
4. Συνεχίστε στην οδό ανώνυμος (838 μ)
5. Συνεχίστε ελαφρώς δεξιά στην οδό Θεσσαλονίκης-Μαλγαρών (571 μ)
6. Συνεχίστε ελαφρώς δεξιά στην οδό ανώνυμος (4334 μ)
7. Συνεχίστε στην οδό Λεωφορος Περικλεους ΠΑ1 μ)

Αναζήτηση με βάση:
την πιο περιβαλλοντικά +

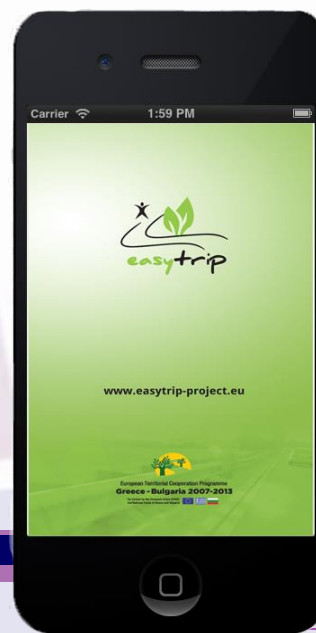
Ωρα έναρξης διαδρομής: 12:30

Ενδεχομένως να υπάρχουν διαφορές από τα αποτελέσματα του χάρτη λόγω κατασκευαστικών έργων, αυξημένης κυκλοφορίας, καιρικών συνθηκών ή άλλων παραγόντων. Τότε θα πρέπει να προσαρμόσετε την διαδρομή σας κατάλληλα. Πρέπει να υπακούετε σε όλα τα σήματα ή τις προειδοποιήσεις που αφορούν στην διαδρομή σας.





Android



iOS

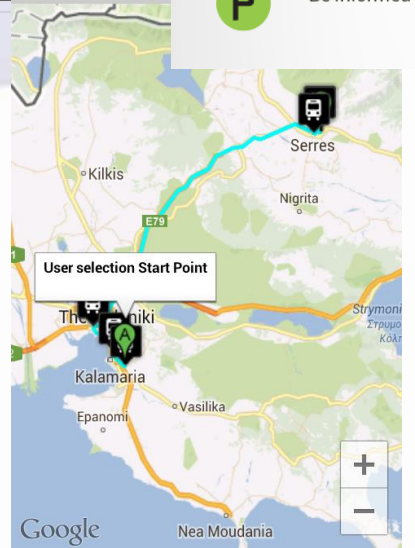
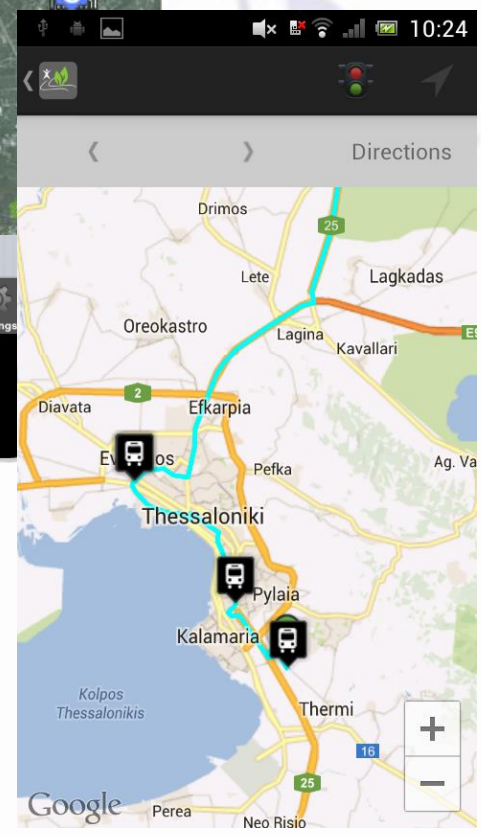
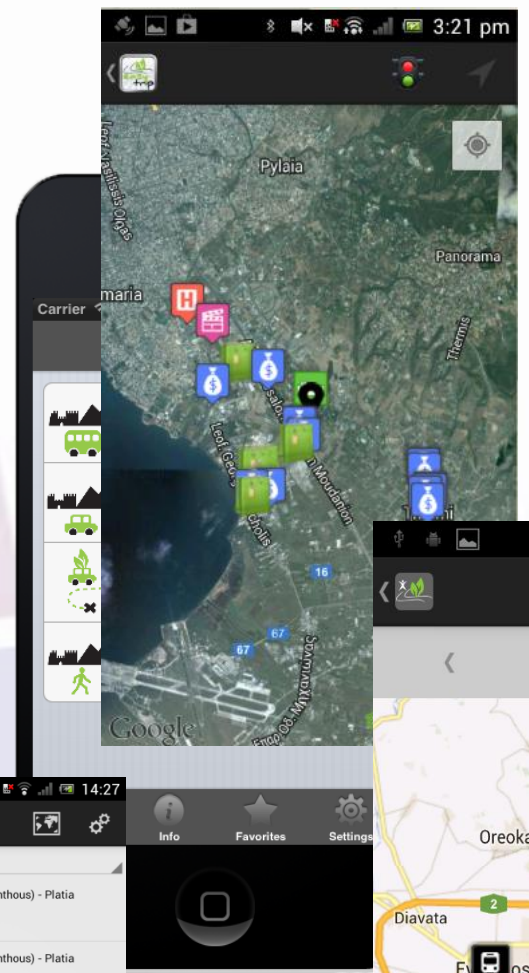
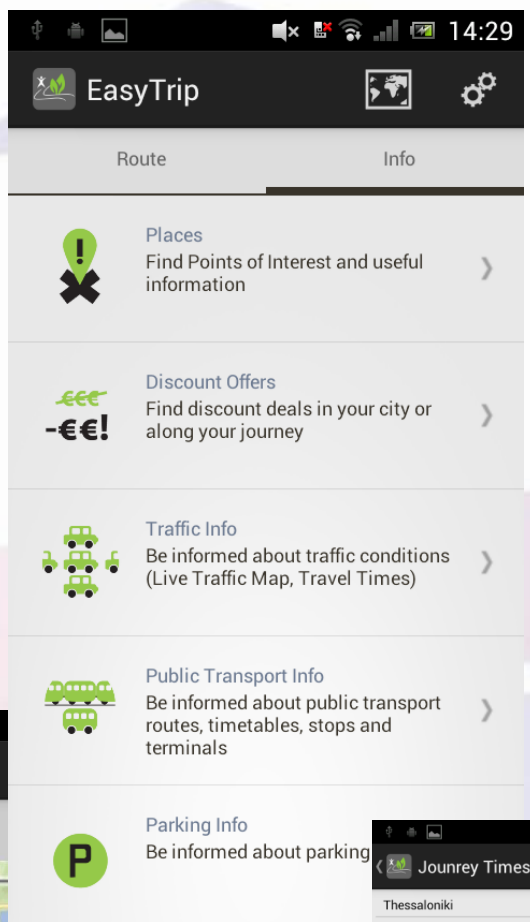
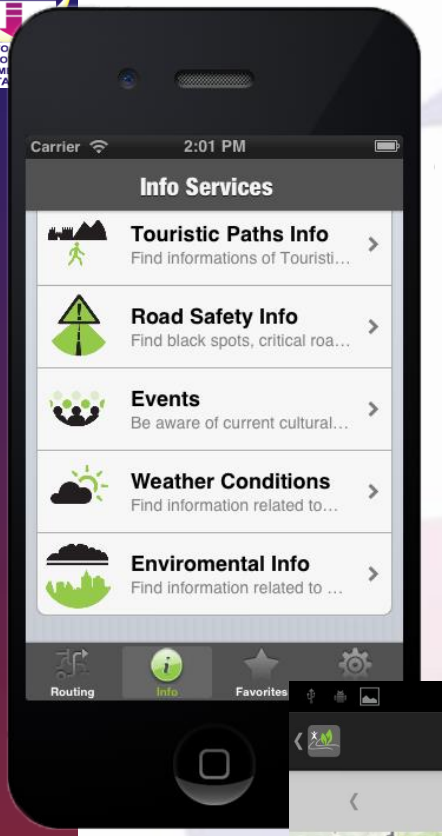
Location based services

<http://www.easy-trip.gr>

<http://www.easytripdata.imet.gr>



INSTITUTOY
KINHHTIKOY
AIKIYON M
EKETA



ΕΘΝΙΚΟ ΚΕΝΤΡΟ
ΕΡΕΥΝΑΣ ΚΑΙ
ΤΕΧΝΟΛΟΓΙΚΗΣ
ΑΝΑΠΤΥΞΗΣ

ITS Test bed & smart mobility living lab

European Innovation Partnership

Smart Cities & Communities



H2020 : SMART CITIES LIGHTHOUSES

Impact



DIRECTORATE-GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A
 ECONOMIC AND SCIENTIFIC POLICY



- Economic and Monetary Affairs
- Employment and Social Affairs
- Environment, Public Health and Food Safety
- Industry, Research and Energy**
- Internal Market and Consumer Protection

Mapping Smart Cities in the EU

STUDY

EN

2014



Team work !



Thank you for your attention !

Dr.. Georgia Ayfadopoulou

Principal Researcher Hellenic Institute of Transport

Centre of Research & Technology Hellas

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Tel: 2310 498451, 2310 498457

Web: www.hit.certh.gr