Shaping the mobility in university campuses throughout ICT solutions

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Background

- **Sustainable Urban Mobility Plans (SUMPs)** define a set of interrelated measures designed to satisfy the mobility needs of people.

- A **University Campus** is similar to an urban model and it could be used as a test area for mobility policies and tools.

- **Information and communications technology (ICT) tools** concern a collection of useful applications, services and tools for mobility areas.
Objectives

- **To analyze University Campuses** in order to obtain a defined state of art of data, policies and ICT tools concerning mobility from/to and inside Campus

- To evaluate the use of specific **ICT tools** on University Campuses from both experts as well general population

- To propose an integrated **ICT platform model** including Data-warehouse, DSS, ITS, enabling data collection, planning, management and monitoring
Methodology

- A **survey** has been developed and implemented within the framework of **CAMP-sUmp** (CAMPus sustainable University mobility plans in MED areas) project

- A survey has been developed consisting of a **questionnaire** and an **interview**

- The following **Universities** participated
  - Magna Graecia Foundation Catanzaro University
  - National Technical University of Athens
  - University of Malta
  - University of Valencia
  - University of Split
  - University of Cyprus
  - University of Bologna
Questionnaire topics:

- **Current mobility** - to present current mobility of the participants both regarding mobility from/to and inside the Campus
- **Desired Mobility** - to present the desired mobility of the participants both regarding mobility from/to and inside the Campus
- **Mobility problems** - to identify the mobility problems both regarding mobility from/to and inside the Campus.
- **Proposed measures/policies/tools** - to evaluate specific measures, policies and tools that are already implemented regarding the mobility from/to and inside the campus
- **Participant information**
The interview aimed to collect qualitative data (experts’ views) of each University regarding the following thematic areas:

- **Soft modes** Infrastructure
- **Public** transport
- **Car** related issues
- **Road infrastructure**
- **Environment** and energy
- **Mobility management**
- **Freight Infrastructure** and Management
- **Information and communications technology (ICT) tools**
- **Sustainable Urban Mobility Plans (SUMPs)**
## Survey characteristics

<table>
<thead>
<tr>
<th>University</th>
<th>Location</th>
<th>Area (m²)</th>
<th>Students</th>
<th>Personnel</th>
<th>Questionnaires</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> University of Catanzaro</td>
<td>Outside</td>
<td>260,000</td>
<td>11,000</td>
<td>500</td>
<td>104</td>
<td>9</td>
</tr>
<tr>
<td><strong>2</strong> National Technical University of Athens</td>
<td>Outside</td>
<td>1,000,000</td>
<td>13,500</td>
<td>3,400</td>
<td>124</td>
<td>8</td>
</tr>
<tr>
<td><strong>3</strong> University of Malta</td>
<td>Inside</td>
<td>194,452</td>
<td>11,500</td>
<td>600</td>
<td>250</td>
<td>2</td>
</tr>
<tr>
<td><strong>4</strong> University of Valencia (1 campus)</td>
<td>Outside</td>
<td>1,000,000</td>
<td>10,000</td>
<td>2,000</td>
<td>227</td>
<td>3</td>
</tr>
<tr>
<td><strong>5</strong> University of Valencia (2 campuses)</td>
<td>Inside</td>
<td>400,000</td>
<td>35,000</td>
<td>5,000</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td><strong>6</strong> University of Split</td>
<td>Inside</td>
<td>245,000</td>
<td>24,000</td>
<td>1,500</td>
<td>100</td>
<td>6</td>
</tr>
<tr>
<td><strong>7</strong> University of Cyprus</td>
<td>Outside</td>
<td>1,200,000</td>
<td>7,000</td>
<td>1,100</td>
<td>85</td>
<td>5</td>
</tr>
<tr>
<td><strong>8</strong> University of Bologna</td>
<td>Outside</td>
<td>6,570,023</td>
<td>85,000</td>
<td>3,000</td>
<td>100</td>
<td>9</td>
</tr>
</tbody>
</table>

- 5 campuses were located **outside** the city centre, 3 are located **inside** the city.
- 1,078 Questionnaires and 36 expert’s interviews were collected.
• The most important type of measures is “ICT tools to improve information to passengers”
• The lowest importance occurs in an ICT platform for car-pooling
The most important type of measures is "**ICT tools to improve information to passengers**"

The lowest importance refers to "**electronic monitoring of parking spaces**"
E-Core system scope

The e-Core System describes the integration of many **independent and self-contained nodes** to satisfy needs and purposes of sustainable mobility at Universities

- a set of **top-level assumption**, variables, actors, stages and nodes
- a **strategic plan** for designing an integrated sustainable mobility system
- a **top-level approach**
- **technology independent**
The e-Core System consists of 6 phases

1. **Users/providers** (diverse profiles which provide vital information to the system)

2. **Data Acquisition** (how the providers can provide the information to the System)

3. **Input** about mobility options

4. **Aggregated Information system** (data are aggregated gathered and organized in different blocks)

5. **Dissemination tools** (website, mobile apps, mobility card)

6. **Output** based on transport mode
CAMP-sUmp e-Core system

INPUTS
- Start and End Point
- Departure Time
- Automatic Geolocation On/Off
- Periodicity
- Accessibility Needs
- Faster Sustainable or Leisure Route
- Registration: ID User

MOBILITY OPTIONS
- YES/NO
- Student or Employee: Others

SELECTION OF NODES
- Gender
- 18<br />

Carpool
- Others

DRIVER
- ID User
- Available Seats
- Fare
- Type of Vehicle
- Roundtrip Time
- Luggage
- Periodicity
- Parking Need

PASSENGER
- ID User
- Type of Vehicle
- Luggage
- Roundtrip Time
- Periodicity

SCHEDULE, LINES AND STOPS
- Frequencies
- Routing System
- Faster/Duration
- Less Transfer
- Leisure
- Intermodality
- Duration
- Cost
- Number of Passengers in Real Time
- Fares and Discounts
- Universal Accessibility
- Payment and Ticketing System
- Incidents
- Real Time Information
- Information Message Alerts to Passengers
- QR Data
- On Route Information
- Promotion and Awareness Campaigns
- Incentives
- Clean Vehicles
- CO2 Emissions Data
- Others

BUILDING LOCATION AND SERVICES
- University Users Data (Legal)
- Events & Remarkable Dates
- Parking Area
- Proposed Routes
- Bike Services and Information
- Fleet of Clean Vehicles and Charge Stations
- Incentives System
- Green Infrastructure
- Campus Mobility in Side and Indoor
- Freight Management
- Promotion and Awareness Campaigns, Social Media
- University Carpool App
• **ICT tools** apply in almost all thematic areas and play a crucial role for every campus sustainable mobility plan

• Campuses have different mobility **gaps/needs** based on their location (inside/outside the city)

• The tools that provide **information to passengers** were found to be the most important based on the questionnaire

• The **architecture** of the proposed System is based on European frameworks for standardization and ITS design

• **E-Core system** is an integrated ICT platform model enabling data collection, planning, management and monitoring