Towards standardised approaches for on-street parking
19 September 2014 - Lisbon

Parking system and Integrated Mobility Approach:
the LIFE+ PERHT project in Treviso

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Mobility Governance: Main Axes of Intervention

- Systems and ICT infrastructures
  - Access Control and enforcement
  - Traffic Light coordination, traffic sensors network...
  - Integrated Parking management, Variable Message Signs
  - Integrated payment and e-ticketing systems
  - Infomobility services pre and on trips,

- Qualification and differentiation of PT services (BRT-BHLS, DRTS etc.)

- Urban logistics services (city logistics, last mile distribution, urban consolidation Centre, etc.)

- Integration of different modalities (FS-Bike, FS-TPL, P&R schemes, etc) and services interoperability

- Green-Soft Measures (bike sharing-station, collective taxi, car pooling, car/van sharing, bike lanes, e-mobility, pedestrian area, etc.)

MIXED SOLUTIONS by TECHNOLOGIES and INFRASTRUCTURES......

but also... ORGANIZATION/OPERATION and NORMATIVE....
The Small and Medium Towns context

- Private car trips are up 70% of total (in some case up 80%)
- Decreasing attractiveness of public transport
- Increase the requirement of flexibility for mobility services
- The freight distribution impacts are relevant
- On street parking plays a key role for city accessibility
- Emerging role of ITS
- Bike Trips and pedestrians are increasing as e-mobility
- Emerging “political sensibility” for “green solutions” and coordinated mobility management

ONE MODEL DON’T FIT ALL TOWNS !!!

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Treviso Small Historic Town

City Area: 52 km² Population: 82,355 ab. Density: 1,583 ab./km

- Walled town with small historic centre
- Well-known tourist destination
- Based for Venice trips
- Raynair HUB
- Limited pedestrian areas
- ZTL – no access control system
- Wide availability of parking near the inner centre and within the first urban ring

Integrated on street Parking Management system
On-street parking management in Treviso: I-PARK SYSTEM

Started on 2010
On Street Parking Management Objectives

- real time **monitoring** of the parking bays occupancy
- real time information of the uses on the “free” bay in order to **reduce unnecessary car trips**;
- real time knowledge of the **payment status** for each bay
- increase the **efficiency** of inspector control activities and reducing the number of street inspectors;
- **reporting** the occupancy index and level of payment for each bays/areas
- to implement **appropriate policies**, area reorganization and parking fee
I-Park Devices

- Network of area wireless sensors (2800 Bays)
- Link among sensors to area parkimeter (56)
- GPRS/UMPTS connecting parkimeters and Control Room
- Network of VMS (5)
- Server for monitoring, control and reporting
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I-Park Info/user services

- On-road VMS panels
- Total bays/Available bays
- Smart card and SMS payment
- Tariffs
- Trevi Move App

Trevi Move
iPark Benefits

**Benefits for the users:**
- No coupon has to be displayed on your car dashboard;
- Ability to extend the parking time from any other parkimeter;
- Multiple payment systems;
- Real time information on the availability

**Benefits for Municipality**
- Creation of a data base occupancy level of bays and area
- Data for profitability analysis

**Benefits for TREVISOSTA parking operator**
- Real time monitoring of the bay occupancy
- Improve the control through portable device connected via GPRS to the server to identify potential violations
- Monitor the inspectors’ activities
- Increase the revenue
- Profitability evaluation of each parking area

Towards standardised approach
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LIFE PERHT Consortium

October 2012 - September 2015

Partners

- **MOM** - Coordinating Beneficiary - Project management – Local stakeholder/PT Operator

- **Treviso Municipality** - Local stakeholder, institutional level, local services management

- **MemEx** – Technical coordination and transport engineering

- **Soffeco SISMAT** – ICT development and integration of advanced solutions

- **EAHTR** - European Association of Historic Towns and Regions Association - Promotion

Collaboration with:
- Taxi Cooperative, TREVISosta (Parking Company)
Perht project approach

Realization a set coordinated **Services and Measures**:

• Monitoring and control of loading/Unloading bays
• Extension of **Bike Sharing service**
• Implementation of a set of **bike stations**
• Introduction of **collective taxi**
• Provision of **infomobility services on mobile apps**
• Promotion of **e-mobility** by Installation of **recharge stations**
• Define **appropriate regulation, incentives** for FEV

**Parking system**: integrated with new **schemes integrated with green services and PT and goods flexible services**

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Management of goods parking bays

- Redesign of load/unload bay and normative (169 bays)
- Installation of sensors and integration in I-Park system
- No payment for parking
- Load/unload bay real time control and reporting warnings
- Road operator control requested by the Italian normative
infrastructured load/upload bay
Bike Sharing Extension

- Based on 16 pick up stations located in the urban area with 70 bikes (more than 120 available slots).
- 1500 users whose 80% are frequent users of the service.
- A total 36000 yearly pick up operations with a total amount of 45000 Km travelled by users.

14 bike routes for 160 Km
Bike Stations

• Installation of n.3 bike stations:
  • near railways station
  • at Foro Boario parking
  • at Miani parking
• Improvement of P+R services (train/car+bike)
• Individual bike use alternative to bike sharing
• Service free of charge
• Available only for PT subscriber
• Video cameras control
• Possibility to use PT smart card

Modal Shift

From parking house/Railway to bike
Col-TAXI Service

COLLECTIVE Taxi service
In cooperation between MOM and Taxi company
"EV RE-CHARGING"
Station and parking lots
Normative, rules, and specific incentives (tariff/timing) for:

- electric vehicles
- Hybrid vehicles
- CNG vehicles

Responsibility of Treviso Municipality
Rules for free parking in the payment bays and for entering in the limited traffic zone
Info mobility platform

Based on EU Project CoCities approach

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App available on the AppStore (IOS) and Google Play (Android)
2,700 users from April 2014
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Mobile apps

- Trip planner
- Parking info
- Ticket purchase
- Link to MoM site
- Logistics
- USER FEEDBACKS
- Search for line info
- Search for Bus stops info
- Read Ticket Via NFC
- Coll Taxi
- News
On street parking management system: bed of roses?

- Last 6 months we analyzed/certified other two systems (like I-Park) realized in two towns by different ICT providers.
- Same “scheme” for the control and monitoring the single bay with differences in devices characteristics and in “communication/connection”.
- Same “scheme” for the payment and user information (smart cards, info panels, app/web, etc).

We found common problems and needs
Starting from a first “banal” (?) consideration as ICT IS PART OF THE “SOLUTION” …..
Which are in any case not always considered by the Authorities.
On street Parking System Scheme

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In the main scheme differences are:

- **Treviso (native)**: integration of control of bay occupancy/payment status, parkimeter is DCU

- **La Spezia**: control only of the bay occupancy without any relation with the parkimeter # DCU

- **Arezzo (no native)**: control of bay occupancy/payment and parkimeter is DCU

**Sensor Installation**

**Battery life**

150 Euro for sensor + installation

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The main common problems

1. Data transfer problems among sensors and CDU for some non-conventional cases:
   a. Sensor covered with disposal like: leaves, papers or simple dust
   b. Bay occupancy lack due to some vehicles typologies and the position inside the bay
   c. Street lateral parking status change due to the big truck

2. Affecting in different way the accuracy of the collected data with low precision...

The accuracy is around 85/90%
VMS Bay Occupancy Information

Is referred to some minutes before

- The communication timing of the “data” between the sensors and the VMS panel (via the DCU) are very high: compared to the current time around 4/5 min to 7/8 min depending on various factors

  1'  
  3'  
  2' 30''  
  Immediato

  PSS  DCU  Centr.Contr  Centro Superv.  Panels

- Depending on the architecture and level of UMTS/GPRS coverage
- Problems clearly also with the APP

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Some Considerations (1/2)

1. For the PSS communication:
   a) Parking area cleaning
   b) Information campaign towards the users to guarantee a correct parking in the area (i.e. by a specific vertical sign)
   c) Implementation of algorithm (based on historical area occupancy trend and Integration of different information)

UMTS area coverage analysis
Installation of VMS Panel not near to parking area
NO Valid for the APP
Consideration (2/2)

- **Need Solutions for subscriptions control** (bays reserved for residents, etc.): contract/user profile loaded on the card, WiFi tag on the vehicles, etc. with impacts also on the on street control procedure;

- **Occupancy Monitoring System integrated after Parkimeter implementation:**
  - Integration with on-road payment device (for cash)
  - Integration with Central System (for cards)

- **Clear identification of Performance index, Maintenance costs and operation procedures**

<table>
<thead>
<tr>
<th>index</th>
<th>Objective Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intermediate</td>
</tr>
<tr>
<td>Control Center availability</td>
<td>99.6%</td>
</tr>
<tr>
<td>VMS availability</td>
<td>99.5%</td>
</tr>
</tbody>
</table>
Parking Management System and Payment

Clearing Centre

Smart Card

Soap Web services

Central System
Bus Operator
Transport Service

Control Centre
PMS

Central System
street parking

Bike Sharing
Central system

bays
Occupancy System
Integrated Payment System

- **Integrated Payment System** with Urban Public Transport Services and other mobility services (bike sharing)
- Use of a common contactless **smart card** for service contracts and e-purse payment/recharge
- **Clearing module between Parking Operator** and Public Transport operator
- **Cards functionalities** for parking:
  - parking hour tariff payment:
    - on-road: users selection of time; off-road: check-in/check-out
  - recharge of e-purse at on-road parkimeters and automatic payment machine (off-road)
  - management of subscriptions (on/off road)
  - renewal of subscriptions (on/off road)
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Towards the standardization

• Use of recognised **international standard** for the smart card;
• Parking/Mobility operators should own **card specifications (data structure)** and **security codes** (SAM/security key);
• to make the investment independent by the system provider (system scale up, integration with other systems, etc.);
• Evaluation of **technological options for SAM/security codes**:
  • management at Central level;
  • management at payment device level.
• **small cities** seems **not profitable market for international player** (card readers, integration with other systems/database etc.)
• **Trade off** between customized solutions and high number market figures;
Thanks!

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Don’t Forget the Complexity

Application context
- Local RTTI contents/services by Local Authorities (Regional, city level)
  - base services
- Independent Travel/Traffic Information Service Providers (TISPs) → Value-added services

Issues and barriers
- different local technologies
- different data formats
- different access services
- Different responsibilities
- ...

Reliability of the systems generating data
Certification of the quality of provided data
Clear Management and operation procedures by the Operators

Operator authorize MOM to use the data

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**TREVI MOVE Services extension**

- Traffic in Real time
- Parking
- Public Transport In Real time
- Real time Journey Planning
User feedback

Service Quality

Data Quality

Events:

Public Transport

Traffic

Parking

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