A Centre for Eco-Friendly City Freight Distribution: Urban Logistics Innovation in Lucca

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Some recent Projects on City Logistics related to Lucca

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Evolution and current trends

- Innovative integrated ITS architectures supporting new service schemes for improved city logistics
  - Reduction of freight traffic impacts, sustainability ...

- An e-Logistics approach
  - e-Business services for B2B interaction among freight and city distribution operators (B2B segment)
  - Interaction with e-Commerce and improved interfaces among the end-users (consumers) and the logistics/retail system (B2C segment)
  - Support for flexible, demand-driven goods distribution schemes integrated in the ITS scenario
Different logistics schemes

- City distribution via "negotiated access" to Limited Traffic Areas
  - "Certificates" schemes, access permits, ...
  - “time windows”
  - booking services

- Cooperative schemes
  - long-range - city distribution
  - transit points, hubs -> load combination, multi-delivery

- Customer-driven deliveries through dedicated Pick-up-collect-Points
  - Park& Buy, Packstations, ...

- Management of shared logistics resources
  - e.g. “Van Sharing”, on demand L/U areas, shared depots/hub...
Some urban logistics experiences in Italy

- Bologna
- Firenze
- Pisa
- Genova
- Vicenza
- Padova
- Parma
- Roma
- Siena
- Terni
- Merope Cities
- Cityports Cities
- Agata Cities
- Life Cities: Lucca, Frosinone

**Differents implementation levels**

- Feasibility study
- Operational schemes definition
- Technological infrastructures definition end realization
- First experimental application
- Fully operational

* Commercial services in operation
The city of Lucca (Toscana Region, Italy)

- A relevant European historic mid-size town with about 80,000 inhabitants (8,000 inside historic centre)
- Town centre restricted to traffic (ZTL)
- Wide pedestrian area
- Relevant tourist flows
- Specific rules for commercial vehicles
- High impacts of freight traffic and city distribution processes
The city of Lucca – Some figures

• A relevant number (1500+) of shops, restaurants, commercial activities in the historic centre (inside the ancient walls) and immediate surrounding urban quarters

• 1680 commercial vehicles entering the area each day

• About 27% of businesses, located in the city centre, use their own means for goods transport

• Low vehicle load factor (< 30% available capacity)
Problems in Lucca related to city logistics processes

- High levels of congestion due to commercial and freight traffic (relevant number of vehicles in the historical centre, non-optimised loads and delivery routes)
- High levels of environmental pollution
- Noise pollution and risk for historical buildings due to vibrations resulting from freight traffic
- Pedestrians (tourists) safety at risk
Measures for mobility management and freight distribution in Lucca in place before CEDM

- Regulatory initiatives and mobility schemes
- Ongoing implementation of telematics infrastructures devoted to mobility management
- Limited Traffic Zones
- Pedestrianised areas
- Specific rules for commercial vehicles

delivery within the historical centre: restrictions applied to some types of goods
The CEDM Project in Lucca

To face in an innovative way the city logistics impacts Comune di Lucca, in 2005, starting from a pre-existing initiative, launch the CEDM PROJECT (Centro Ecologico Distribuzione Merci)

CEDM is a project part-funded by the EC under the LIFE Environment initiative (Contr. No. LIFE05 ENV/IT/000870)

Start 11/05 - End 04/08
CEDM Project Background

- **Plans for realisation and financing of the C EDM**
  - Pre-existing initiative of Comune di Lucca

- **Feasibility study on C EDM and new city logistics for Lucca**
  - MEROPE project (Interreg IIIB Medoc c )

- **eDRUL RTD project (5FP, IST Program)**
  - Innovative city logistics schemes for historical centres
  - Supporting IT architecture and e-services
  - Partners expertise: COTAS, Memex, Softeco

- **Other European experiences**
  - Aalborg (project partner)
  - Others in Europe (via eg BESTUF S II network)
  - Others in Italy (eg Vicenza, Frosinone, …)
Overall CEDM Project Objective

City logistics as a "Set of measures"

- Regulatory
- Organisational
- Operational
- Technological

**to enable the realisation and start-up of the Centre for EcoFriendly City Freight Distribution for the historical centre of Lucca**
Achieved Results

- **Reduced impacts of freight traffic in the city centre**
  - Reduced total number of vehicles in the centre
  - Improved distribution schemes: optimisation of load (consolidation) and delivery routes
  - Development of added-value innovative services
  - Eco-friendly delivery vehicles

- Reduced environmental impacts (air quality, noise)
- Reduced risks for historical buildings
- Increased pedestrian safety
- Improved quality of life in the historical centre
- Creation of a “Direction Cab” for logistics processes
- Creation of new occupational opportunities
Project Partners

• Comune di Lucca (Co-ordinator)

• Regione Toscana

• Memex srl

• COTAS Logistica srl

• Softeco Sismat SpA

• ENEA

• Aalborg Kommune (DK)

• Lucense - Technical assistance
CEDM Project Actions (1/3)

- Analysis and definition of reference service schemes
  - Background regulatory and normative issue

- Analysis and identification of suitable vehicle technology

- Design and realisation of the enabling IT architecture to support
  - CEDM operation
  - Information and work flows within the logistics chains
    - B2B, B2C services

- Specification of energy and environmental goals
CEDM Project Actions (2/3)

- **Realisation of the CEDM**
  - **Logistics Platform** (Logistics Base)
    - Implementation funded outside LIFE-CEDM project
    - Demonstration funded within LIFE-CEDM
  - **IT system and services**
  - **City distribution eco-fleet**

- **Demonstration**
  - CEDM operation
  - City logistics schemes and services
  - IT architecture and services

- **Evaluation**
  - Reference indicators
  - Energy, environmental impacts
  - Economic impacts and sustainability,
  - Structure of the CEDM Management Company
CEDM Project Actions (3/3)

- **Generalisation of regulation**
  - Regional, national level
  - Comparison with EU situation

- **Transferrability**
  - Assessed reference scenarios
  - Guidelines to promote transfer

- **Promotion**
  - National level
  - European level
Overall CEDM Measures

CEDM measures are based on city logistics schemes integrated in the broader context of mobility and transport measures:

- **Restrictions** to regulate freight deliveries
  - e.g. time slots, minimum load factor, use of electrical vehicles

- **Access for deliveries granted only to freight operators meeting access requirements**

- **Cooperation between freight operators**
  - e.g. load consolidation, transhipment at freight transit points, etc.

- **Implementation of innovative citizens and tourists oriented delivery schemes**
  - e.g. at hotels/parkings, freight transit points, etc.

- **Efficient management of reverse logistics.**
Reference City Logistics Agency

- Base city logistics services,
- Additional, value-added city logistics services

- Logistic physical base
- IT platform
- Ecological van fleet

IT systems and infrastructures interfacing

- e-Commerce Services
  - Consumers
    - virtual shopping malls
    - purchase groups
  - order management
  - delivery services
  - payments
  - ......

- e-Business Services
  - Commercial Operators
    - resource management
    - delivery planning
    - payments
    - ......

- Urban Mobility Services

- Logistics Management
  - delivery planning
  - route planning
  - optimisation
  - tracking & tracing
  - service monitoring
  -- communication
  - ......

- Fleet and Delivery Services

- Logistic Base Services

- Freight Operators
  - resource management
  - delivery planning
  - payments
  - ......
Base city logistics services
B2B - cooperative City Distribution Terminal (CDT)
Base city logistics services
B2B – Cooperative and “virtual” city distribution terminal
Value Added city logistics services

- **Home delivery services**, for specific user categories (e.g. elderly people, etc.).
- **Delivery services to specific locations** (hotels, park&buy, etc.).
- **Delivery services via dedicated good collect points** (Pick-up-Points, e-Lockers, Safe Boxes, etc.).
- **Loading/Unloading Areas** supported by electronic reservation services, used identification, payment.
- **Reverse logistics services**, for collection and delivery of refused/returned goods, packaging materials, logistics wastes, etc.
- **Third-party remote warehousing services**, providing space rental, remote stocking services and related electronic services (e.g. stock state information, replenishment order submission, etc.) for interested shops and other service operators.
CEDM IT platform

- **IT platform** is one of the main CEDM project outcomes
  - Realisation of an IT Platform to support CEDM operations
  - Complete cycle: specs, design, prototype, v&v, demonstration
CEDM IT Platform main functionalities

- booking, planning and management of logistics services
- managing information distribution (consumers, logistics operators)
- coupling long-range freight processes and city distribution → cooperation between operators
- an “open architecture” (services) supporting different operational business models and innovative added-value services
CEDM IT platform HW architecture
CEDM Logistic Base Location - Evaluated best options

1 - Area Viale Luporini
2 - Area Ex Bertolli
3 - Area scalo merci FFSS

A - Casello Autostradale Lucca Ovest
B - Casello Autostradale Lucca Centro
CEDM Logistic Base - Final chosen location
CEDM Logistic Base project

Arch. Angelo Sebastiani
CEDM Logistic Base project (rendering)

Arch. Angelo Sebastiani
CEDM Logistics Base project (construction site)
CEDM Logistic Base Completed
CEDM Self Sustainable Business

- More than 200 delivery per day (18% of the local market in the Lucca city centre)
- Gradually consolidating and escalating the business
- Supporting regulation of the Municipality
Van Fleet: pure electrical model

- Two 3.5 tons lorries
- One 1.6 ton lorries, plus two smaller ones
- Other two 3.5 tons lorries booked in for 2010
Management and Financing Aspects

- Management and organisational infrastructures as a critical factor
  - in many cases determined the failure of several initiative of city logistics innovation.

- Approach taken in Lucca, based on two main general directions:
  - **Strong local consensus** among the involved stakeholders and user categories.
  - **Building up a management organisation**
    - initial control by the **Public Administration** (start-up phase)
    - plan of a possible **gradual transition to private stakeholders**, once the economic sustainability is consolidated (consolidation phase)
More information available on:
Thanks for your kind attention

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