

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

*Mauro Di Bugno, Comune di Lucca, Lucca, Italy*

Spain – May 2010

## Some recent Projects on City Logistics related to Lucca

<ul style="list-style-type: none"> <li>• <b><u>MEROPE</u></b></li> <li>• <b><u>AGATA</u></b> led by Regione TOSCANA</li> </ul>	<b>INTERREG III B MEDOCC</b>
<ul style="list-style-type: none"> <li>• <b><u>CITY PORTS</u></b> led by Regione EMILIA-ROMAGNA</li> </ul>	<b>INTERREG III B CADSES</b>
<ul style="list-style-type: none"> <li>• <b><u>eDRUL</u></b> led by SIENA PARCHEGGI SpA</li> <li>• <b><u>MOSCA</u></b> led by PTV</li> </ul>	<b>EU V° FP - IST</b>
<ul style="list-style-type: none"> <li>• <b><u>CEDM (Best LIVE ENV 2008)</u></b> led by COMUNE DI LUCCA</li> <li>• <b><u>C-DISPATCH</u></b> led by PROVINCIA DI FROSINONE</li> </ul>	<b>LIFE ENV</b>
<ul style="list-style-type: none"> <li>• <b><u>LUSLIN</u></b> <i>led by Comune di Lucca</i></li> <li>• <b><u>LOVE LUCCA</u></b> <i>led by Comune di Lucca</i></li> </ul>	<b>Italian Environment Ministry</b>

# 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

B2B

## ❖ Cooperative schemes

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

B2B

## ❖ Customer-driven deliveries through dedicated Pick-up-collect-Points

- Park& Buy, Packstations, ...

B2C

## ❖ Management of shared logistics resources

- e.g. “Van Sharing”, on demand L/U areas, shared depots/hub...

B2B/B2C

# 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*

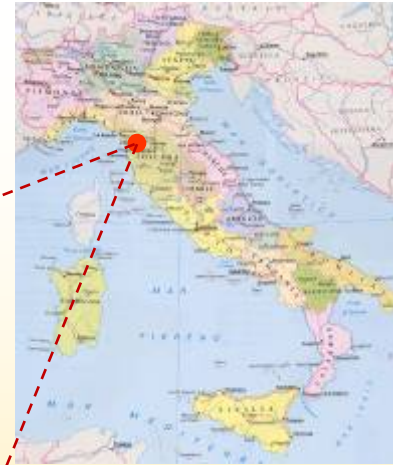
- *Feasibility study*
- *Operational schemes definition*
- *Technological infrastructures definition end realization*
- *First experimental application*
- *Fully operational*

\* 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

Type of goods	Permit area(s)	Time and other limitations
Perishable goods	LTZ, A Area, B Area	7:00-10:30, 15:00-16:30 and 18:30-20:00
Medicines & drugs	LTZ	Any time of the day (max. 20 mins parking)
	A Area, B Area	7:00-10:00, 12:00-13:00, 16:00-17:00, 18:30-19:30 (max. 20 mins parking)
Fuels	LTZ	Any time of the day
	A Area, B Area	8:30-13:00, 14:30-15:30
Sales representatives (yearly duration permit)	LTZ	Any time of the day. Parking allowed only in dedicated yellow marked lots
	A Area, B Area	8:00-14:00, 14:30-15:30, 19:30-20:00
Tobacco and state monopoly goods (yearly duration permit)	LTZ	Any time of the day. Parking allowed only in dedicated yellow marked lots
	A Area, B Area	8:00-12:00

## 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)**

*Centre for EcoFriendly City Freight Distribution*

**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 CEDM**
  - Pre-existing initiative of Comune di Lucca
- ❖ **Feasibility study on CEDM and new city logistics for Lucca**
  - MEROPE project (Interreg IIB Medocc)
- ❖ **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 BESTUFS 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**



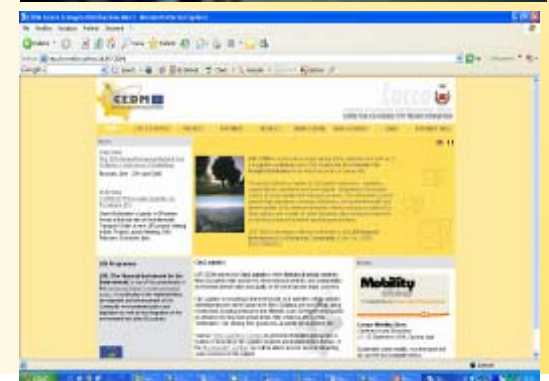
- **ENEA**



- **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

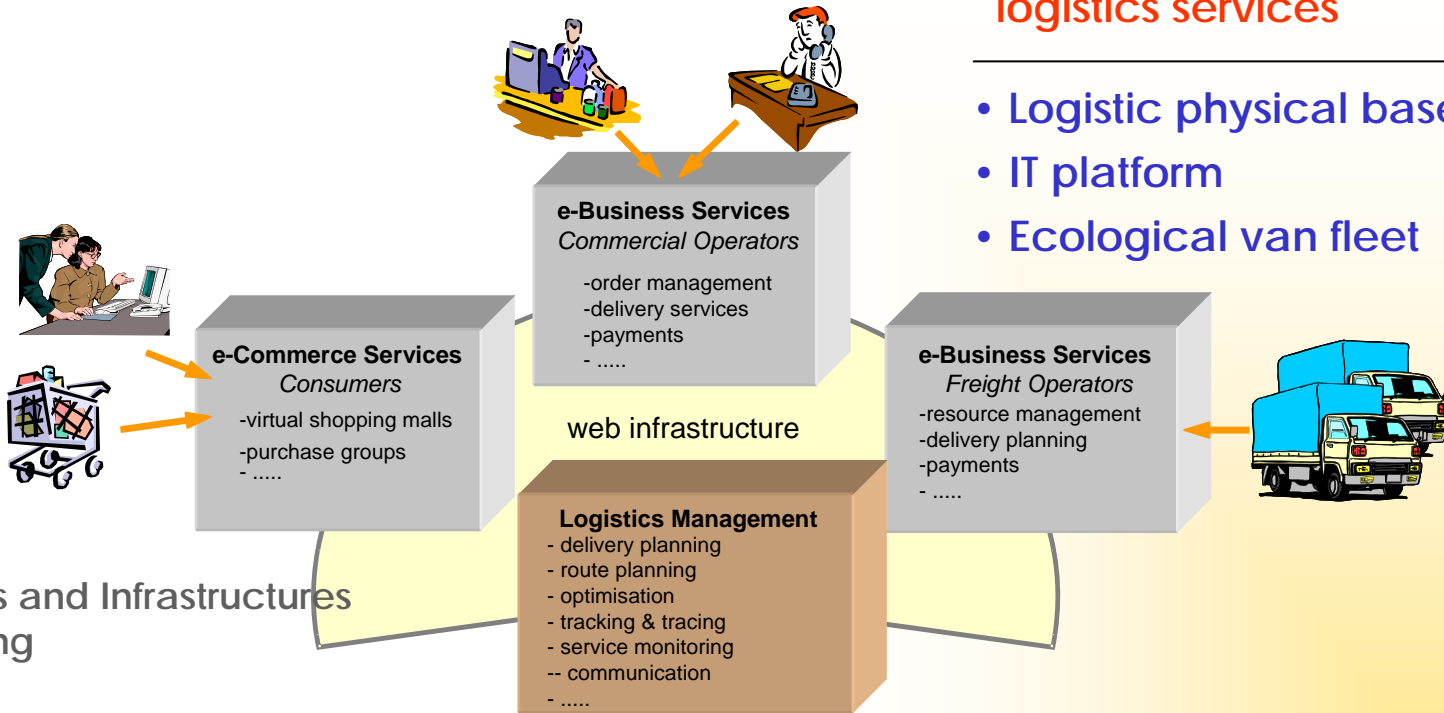
**CEDM measures are based on city logistics schemes integrated in the broader context of mobility and transport measures:**

- ❖ 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, transshipment 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.

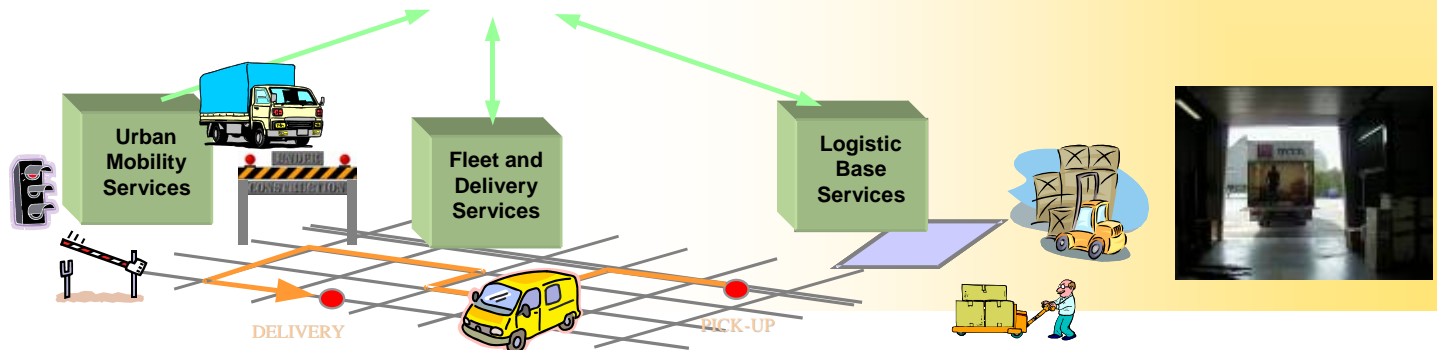
# Reference City Logistics Agency

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

- Logistic physical base
- IT platform
- Ecological van fleet

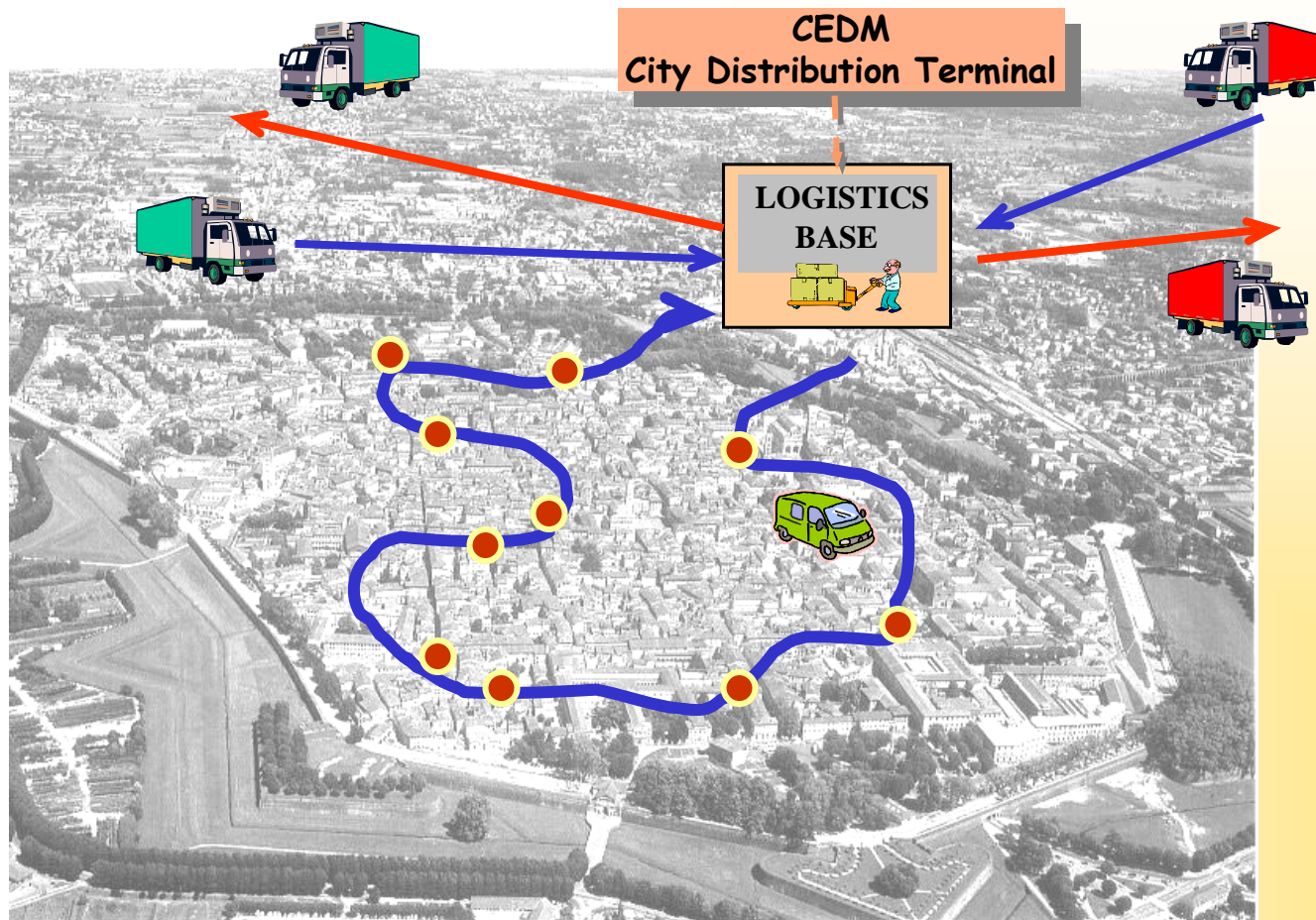


IT systems and Infrastructures interfacing



# Base city logistics services

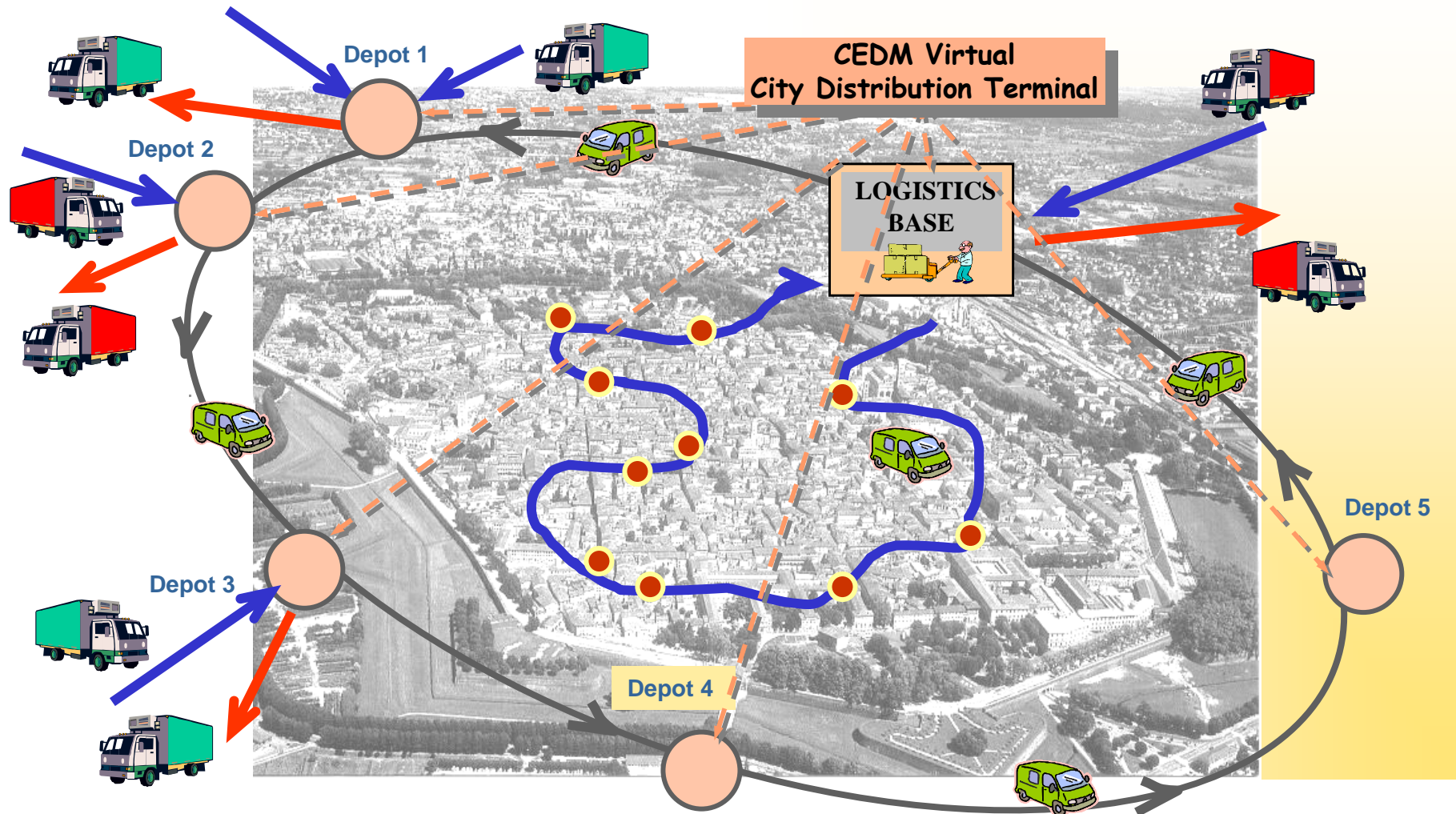
## B2B - cooperative City Distribution Terminal (CDT)





# Base city logistics services

B2B – Cooperative and “virtual” city distribution terminal



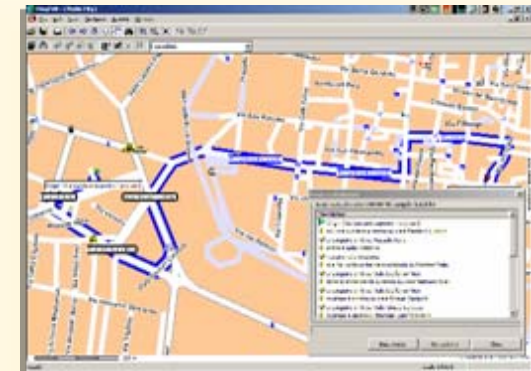
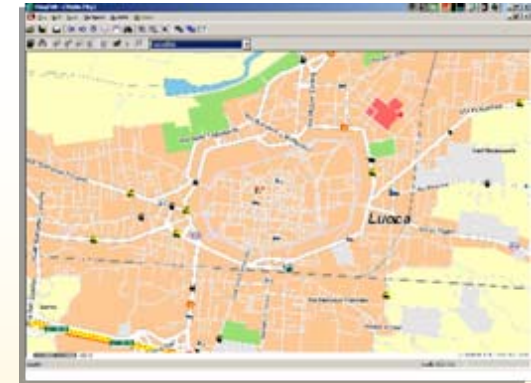
## Value Added city logistics services

- ❖ **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.



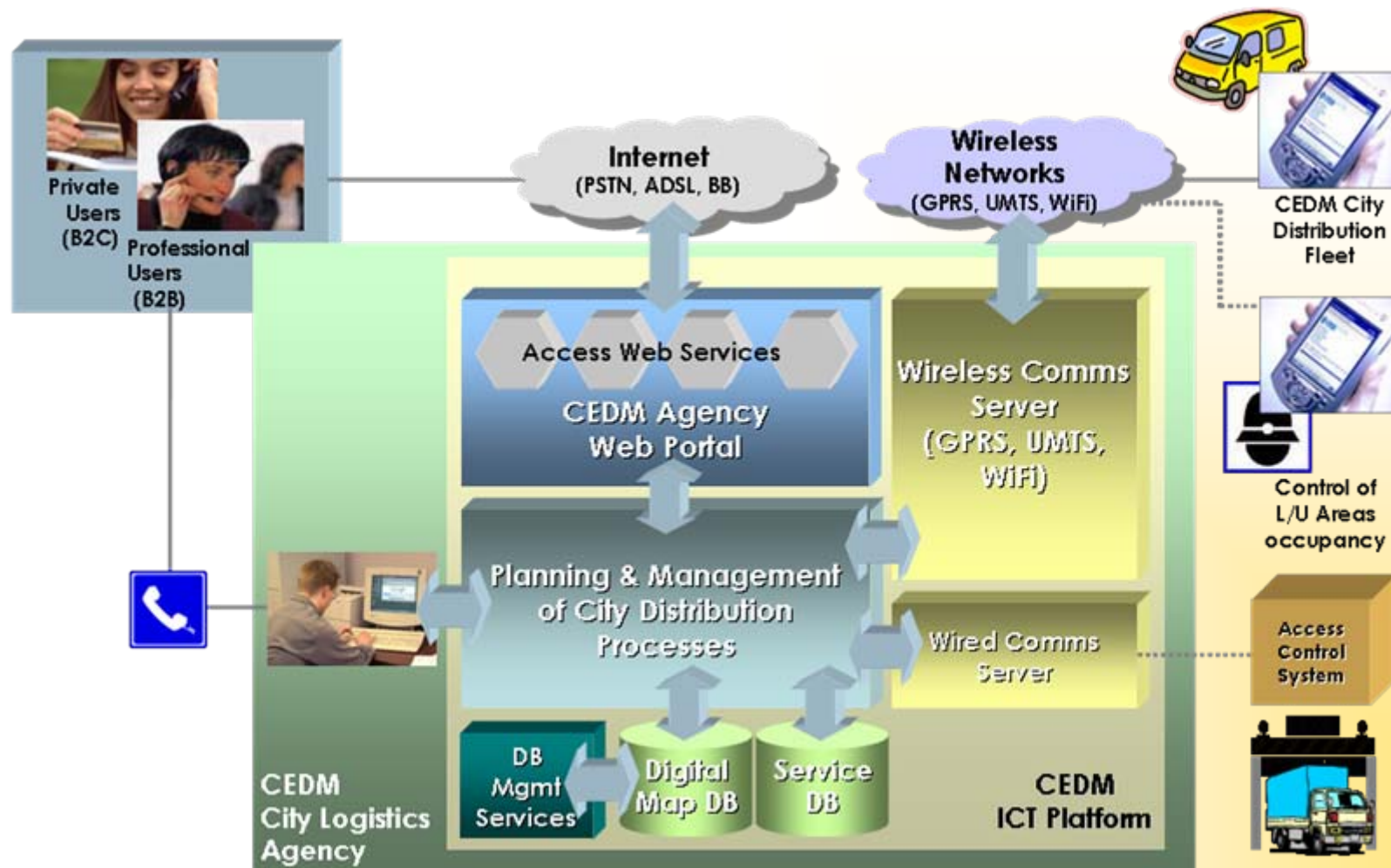
## CEDM IT Platform main functionalities

- 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

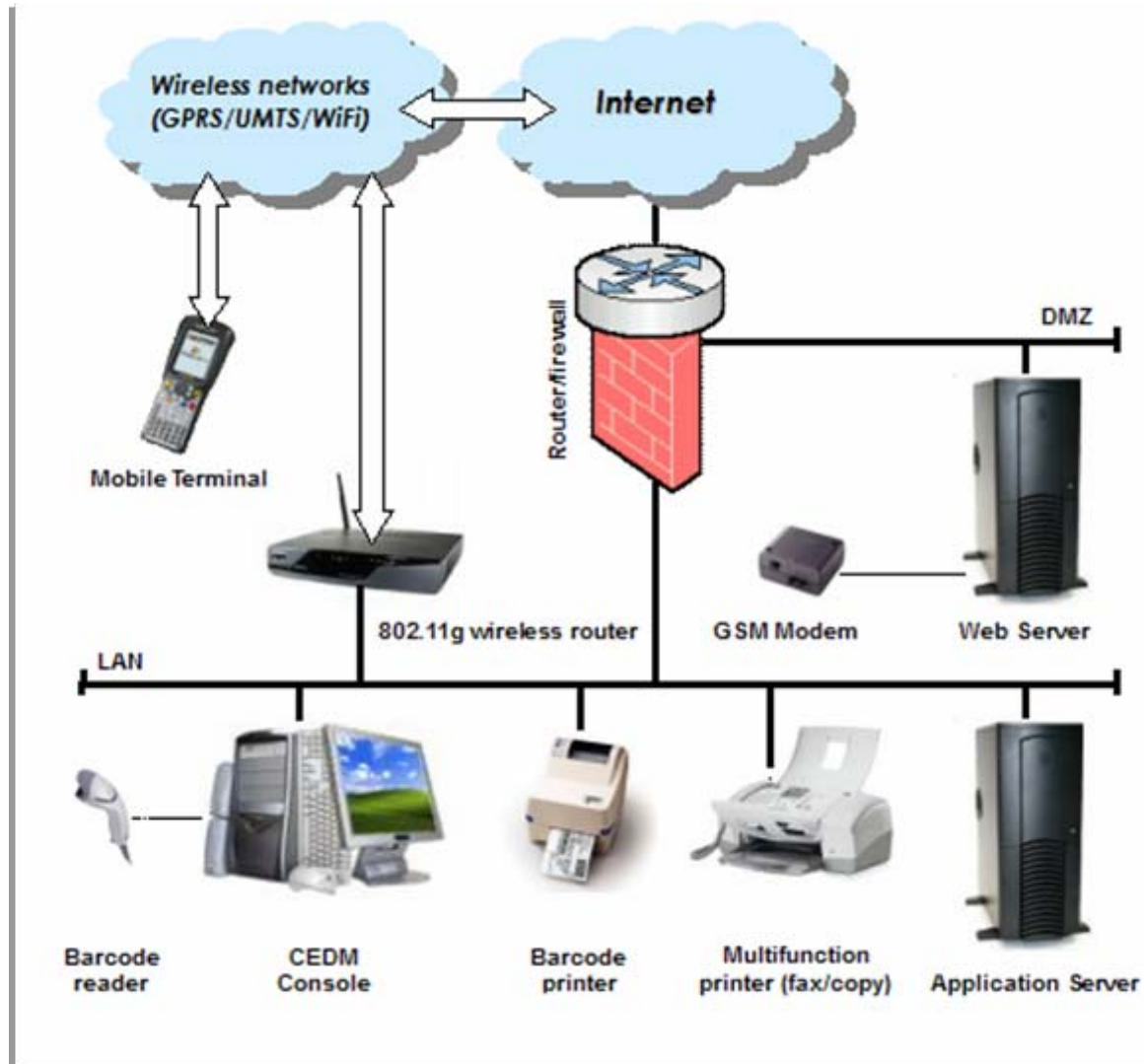




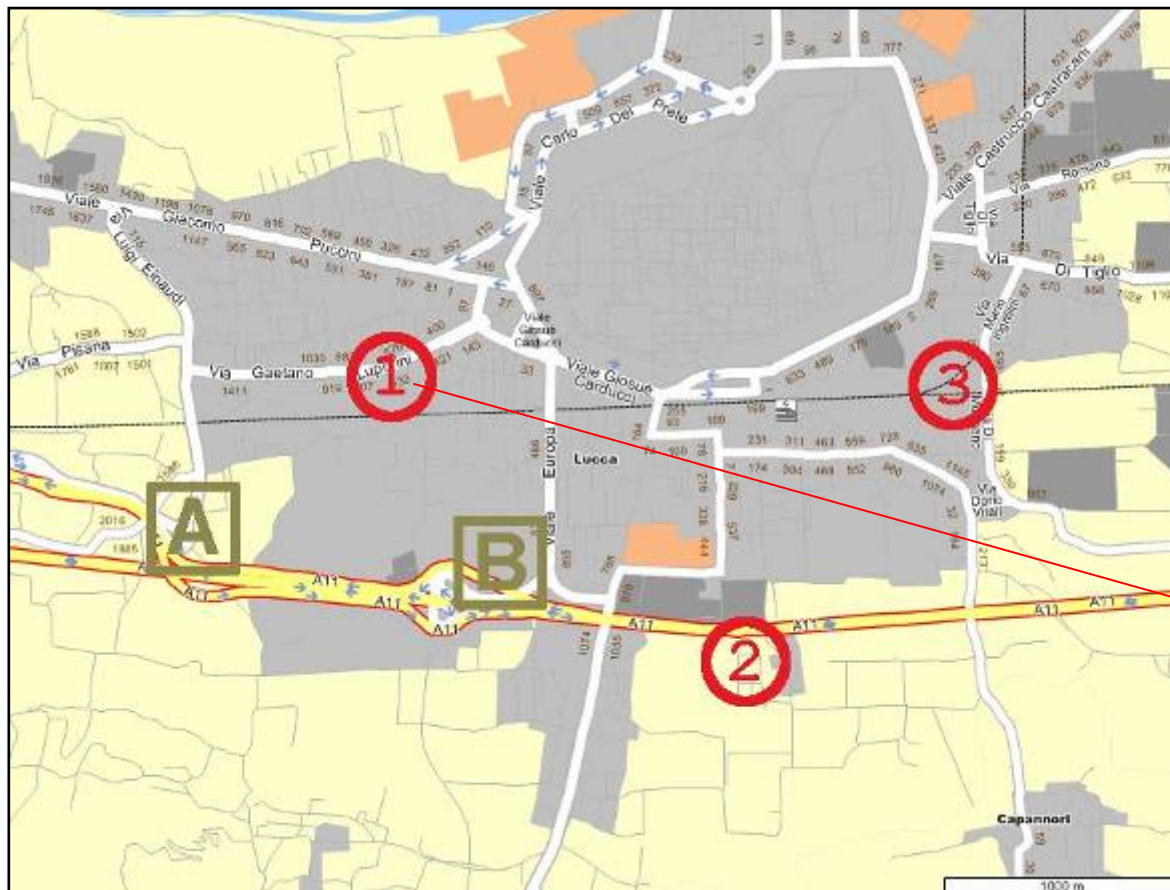
# CEDM IT platform logical architecture



# CEDM IT platform HW architecture



# CEDM Logistic Base Location – Evaluated best options



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

A - Casello Autostradale Lucca Ovest  
B - Casello Autostradale Lucca Centro

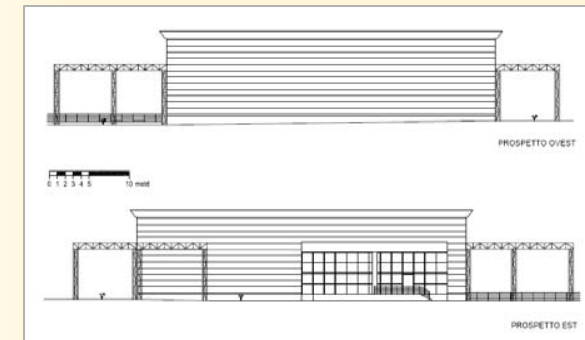
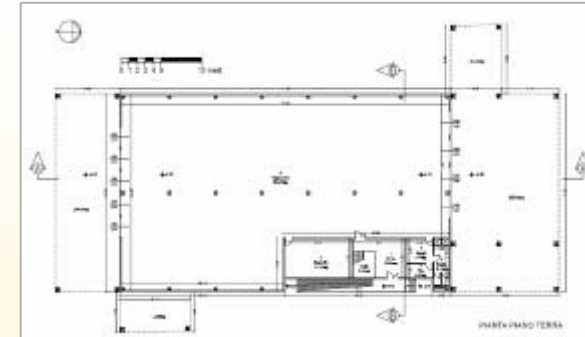
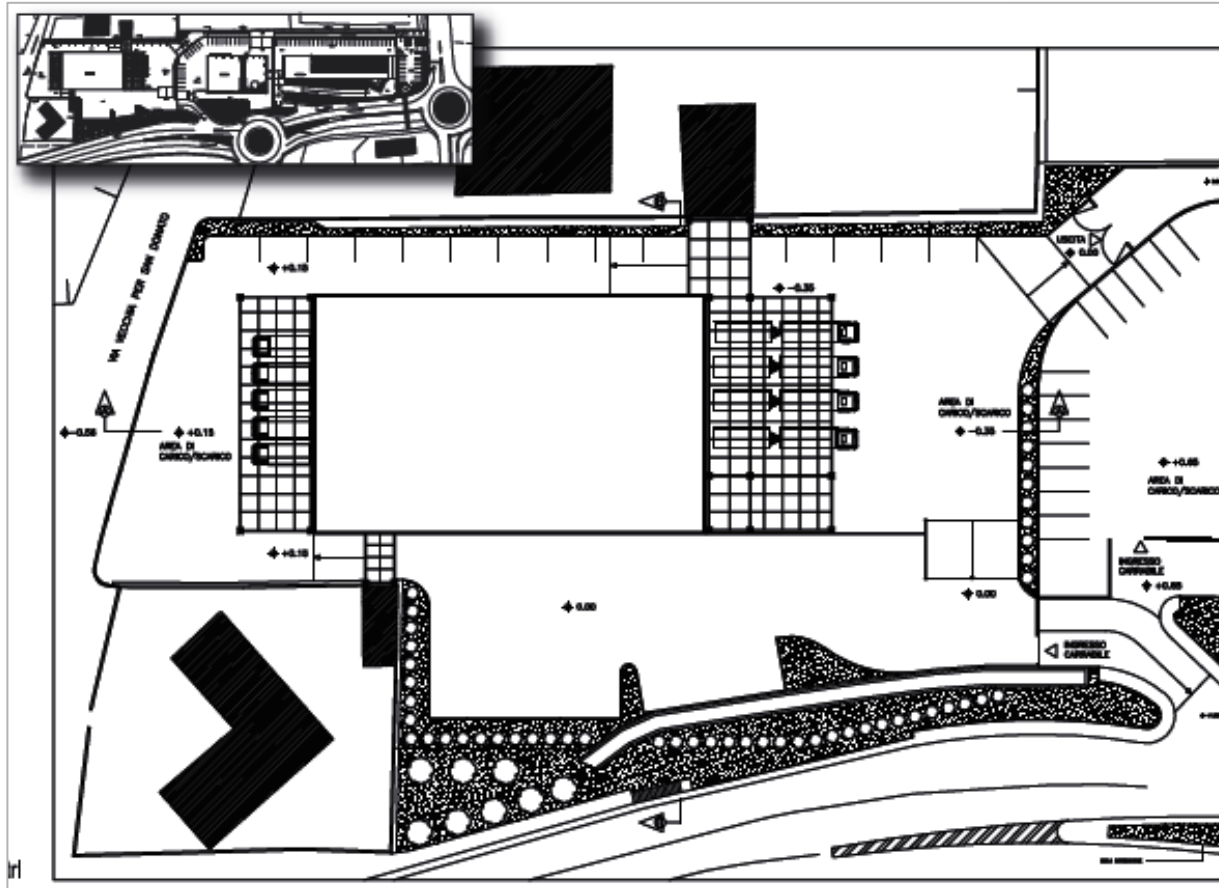




## CEDM Logistic Base – Final chosen location



# 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:



In collaborazione con



e con i progetti



*Ministero dell'ambiente e della tutela del territorio e del mare*



Centre for Eco-Friendly City Freight Distribution - CEDM - Centro Ecologico Distribuzione Merci  
Un approccio integrato alla City Logistics



A cura di:

Mauro Di Bugno, Stefan Guerra,  
Antonio Liberato, Giorgio Ambrosino

Contiene  
English Abstract  
DVD-ROM  
Video





Thanks for your kind attention

Mauro Di Bugno

Municipality of Lucca

[m.dibugno@comune.lucca.it](mailto:m.dibugno@comune.lucca.it)