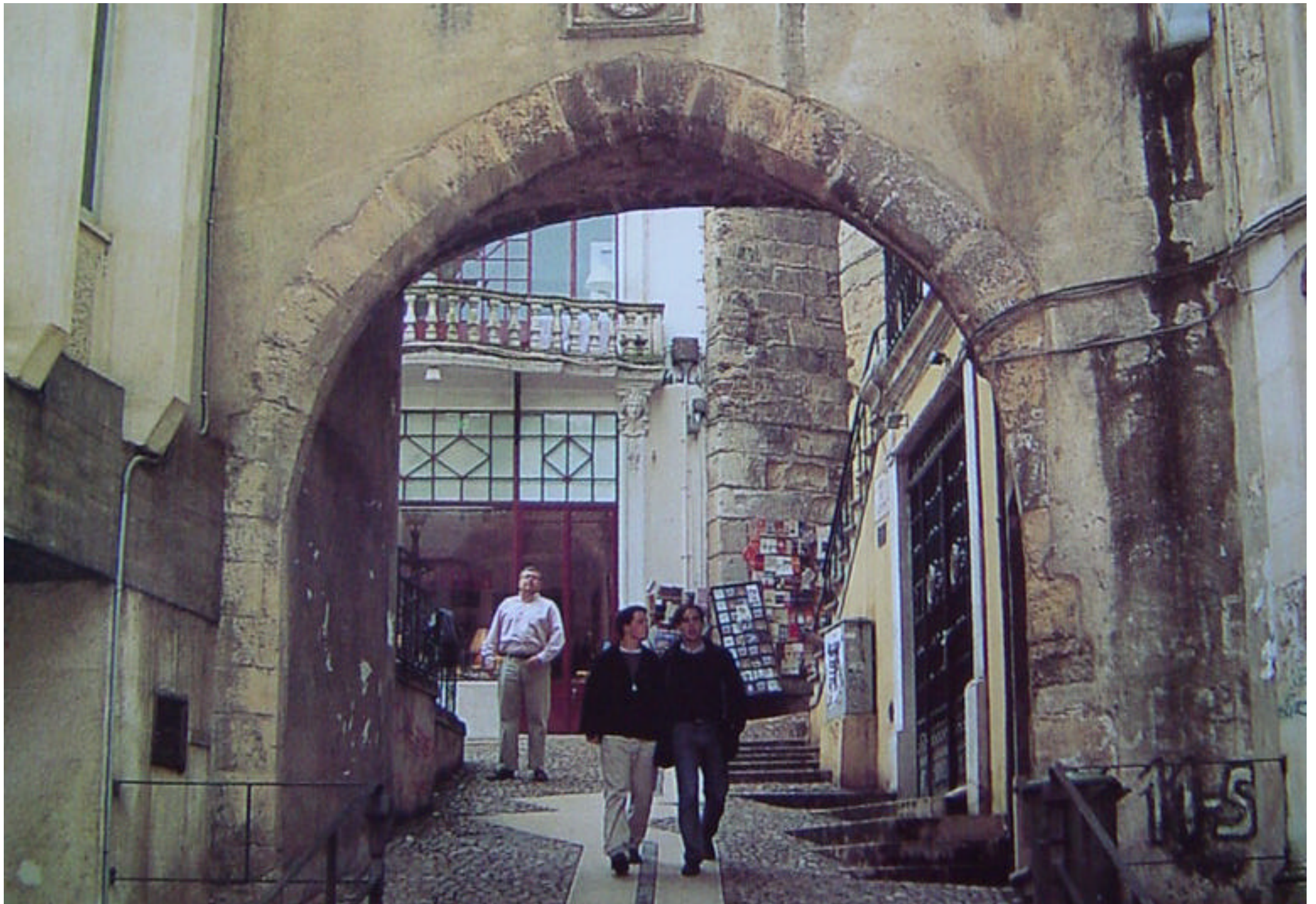


Beautiful Coimbra













P
PARKING

P
RETIRE AQUI O SEU BILHETE



ITS Solutions

- Access control
- Congestion charging
- Parking control
- Better public transport
- Car pooling / Car sharing
- Information
- Cybercars



Cybercars

- Road vehicles (Micro-car to mini-bus to busses)
- Low speed driving automation. Dual mode?
- Existing road infrastructure
- Segregated automatic mode (from drivers)
- Central management system (CTS)
- Public door to door on demand transport
- Private vehicles allowed in the future

Cybercars Objectives

- Reduce the need for public space dedicated to transport
- Reduce local nuisances
- Offer a transportation accessible to all
- Improve mobility
- Reduce cost of transport

CyCab (1996)



First Operational Cybercar



Serpentine (Lausanne)



AGV (Yamaha)



CyberCab (Yamaha-INRIA)



ULTra



Robosoft - Roburide



ParkShuttle II



Major R&D Tasks

■ Vehicle :

- Controls
- Navigation
- Collision avoidance
- Platooning

• Infrastructure :

- Management
- HMI's
- Remote control
- Energy

+ Certification

Controls

- **Actuators and controllers**
- **Network architecture**
- **Redundancy**
- **Software generation and certification**

Navigation

- **Path following**
 - Wire guidance
 - Magnets
 - Landscape features
- **Absolute positionning (DGPS, ING, Vision)**
- **Road following**

Collision avoidance

- Scanning laser(s)
- Ultra-sounds
- Vision (stereo)
- Fusion

Platooning

- Trains of cars
- Merging and splitting
- Crossings

Management

- **Infrastructure-Vehicle communication**
- **Vehicle control**
 - **Departure**
 - **Destination**
 - **Speed**
 - **Check points**
- **Fleet management**

HMI

- **Vehicle requests**
- **Vehicle entry and fare collection**
- **Destination and changes**
- **On-board information**
- **Communication devices**

Remote Control

- **Status reporting and localisation of vehicles**
- **Remote stoping**
- **Remote operation**
- **Audio/Visual communications**

Energy management

- On-board energy storage
- Optimum energy usage for vehicle operation
- Energy transfert (fixed/moving)
- Fleet management

**Thank you for
your kind attention**

