



**Zakład Transportu L-32**

Instytut Zarządzania w Budownictwie i Transporcie  
Politechniki Krakowskiej

# Ecological urban logistics in the historical centres of cities

**Authors:**

**Sabina Puławska, Wiesław Starowicz**

# Ecological urban logistics in the historical centres of cities

More than **70%** European citizens live in more and more congested cities suffering from side transport effects: **transport noise, time losses (as a result of congestion) and deteriorating air quality.**

White Paper, 2011: 'zero-emission urban logistics' 2030:

- Produce best practice guidelines to better monitor and manage urban freight flows (e.g. consolidation centres, size of vehicles in old centres, regulatory limitations, delivery windows, unused potential of transport by river).
- Define a strategy for moving towards 'zero-emission urban logistics',
- Promote joint public procurement for low emission vehicles in commercial fleets (delivery vans, taxis, buses etc.).



## Conception of new solutions for urban logistics in the historical city centre:

- Caravel/Civitas II in 2008 - „New freight distribution plan in Krakow”
- Focused on historical centre of the city where social and business life is concentrated as well as different needs, including additionally prestigious function, are met
- To improve freight transport in this historical centre.

### Conception:

- Credit points system based on camera registration system
- Entry fee system to the Market Square based on the subscription

# Krakow

## Main goals:

- creation of uniform control system of delivery vans access to the limited traffic zones
- providing an effective freight distribution in the protected zones (100% only environmental friendly vehicles)
- quality improvement of freight distribution services
- social approval for limited access of delivery vans to the historical centre of Krakow
- implementation of freight distribution based on environmentally friendly vehicles
- reduction of number of private carriers entering the historical city centre
- improvement of freight distribution in the Krakow old town

## Credit points system based on camera registration system

Basic principles (Kaim, 2008):

- clear criterions of credit points calculation (only entry; or time spent in the zone inc. loading operations)
- selection of behaviour - deliveries in early mornings not causing congestion in the peak hours
- assessment of credit points provisionally given to the carriers and merchants (“free points”)

Fuel	Entry time	Amount of credit points	free entrance/ 1 month
Electric vehicle or CNG	23.00-7.00	0	No limit
Electric vehicle or CNG	7.00-9.30	2	75
LPG or vehicles of engine displacement < 1500 cm <sup>3</sup>	23.00-7.00	4	37
LPG or vehicles of engine displacement < 1500 cm <sup>3</sup>	7.00-9.30	10	15
ON/95/98	23.00-7.00	15	25
ON/95/98	7.00-9.30	30*	5
Refrigerator trucks regardless of type of vehicles	23.00-7.00	6	40
Refrigerator trucks regardless of type of vehicles	7.00-9.30	30	8

- valuation of entries
- price for credit points

## Conclusions

- The credit points-based solution of collecting and calculating the data was checked in the field and seems to be effective.
- Promoted operating solutions (cameras or PDA-based solution) weren't approved by stakeholders

**IMPORTANT achievement: start of the debate on problems of urban logistic and increase of awareness of carriers, receivers but also politicians responsible for life quality and comfort of city inhabitants**



## The main activities:

- Transport research on goods flows in the demonstration area and determination of transport policy measures for sustainable city logistics;
- Development of computer model simulating efficient distribution of goods in a demonstration area, mainly in the city centre (reduction of emissions, distance travelled by vehicles and reduced energy consumption by 10 - 20 percent);
- Establishment of a national internet web portal for promotion and support to sustainable city logistics;
- Online routing tool (interactive map) to support delivery companies in finding optimal deliveries routes in the city centre.

## Research (2009)

- Duration of delivery,
- EURO standards and capacity
- Location of shops and small companies in the city centre

**Simulation program (2012)** - data from enquiries and traffic flow, number of deliveries in city centre, estimated weight of transported goods, total time of deliveries (including loading), type of the vehicle and freight.

**Calculation** of energy, measurement and calculating of pollution' emission.

**Results of simulation** - consolidation of deliveries would reduce emission of **CO<sub>2</sub> by 17,6%, NO<sub>x</sub> – 18%, PM10 by 17.8%; fuel consumption by 17,7%** (results presented both: 24 hour effects as well an annual effect).

# Poitiers

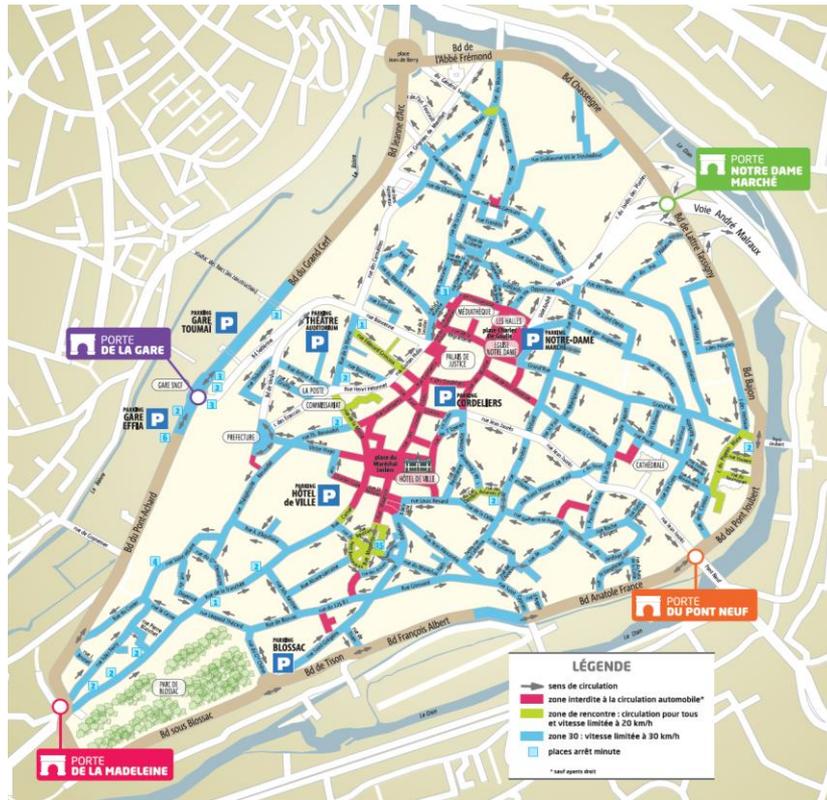


Fig. Centre of Poitiers, pedestrian zone – red colour; limited speed zones zone (20 and 30 km/h) - blue and green colours (www.poitiers.fr)

- Narrow, one-way streets – difficult deliveries.
- City authorities to protect historical centre have introduced pedestrian zone (to be consecutively extended).
- Restriction of carriers traffic - figure .
- Surveys have been conducted among 559 shops and commercial activities.
- 1 shop (or service point) is delivered every week by 5 deliveries and 40% shops are supplied by 80% deliveries.

# Poitiers

## The solution:

- To organize parking places for loading and unloading operations.
- To select the most convenient locations data concerning deliveries, technical possibilities and DALSIM application – measure supporting decision making process have been taken under consideration.
- As a result 13 unload parking places – 3 in the very centre and 10 at the border of the historical zone – have been established.
- Parking for all vehicles – except for fixed places is not permitted (because f.i. bollards on the pavement) – figure.
- Permissible parking time is 10 minutes and is controlled by the system - Each prolongation (over 10 minutes) the street service.



Fot. (Rudnicki & others, 2010)

Those activities contributed with shortening average time parking time – 83% of parking lasted less than 10 minutes. In 17% cases prolongations lasted maximum 5 minutes. In the unload parking places at the border of the city centre average 27 carriers' vehicles were observed in one parking place while in the very centre – 3.5.

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# CONCLUSIONS

Transport service in the centre of historical cities is one of the most difficult challenges of present-day urban logistics. Trade off - to provide adequate accessibility for inhabitants and freight distribution AND appropriate conditions for intense bikers' and pedestrians' traffic  
Big number of stakeholders which needs - often contradictory – influence proposed solutions and contribute with difficulty to implement of improving system for urban logistics



# CONCLUSIONS

**Need of high life' standard** in the city including first of all possibility to quick moving both on foot and by public or private transport, clean air and not bothersome level of noise as well as attractive, beautiful urban spaces like historical centres consist expectations in contradiction to needs for quick deliveries and other expectations of entrepreneurs.

**Role of local authorities**, focused on the city development, growing employment possibilities but also reduction of congestion and their environmental and social impact is to be considered; to solve of conflicts between other groups of interest.

Effective implementation of ecological urban logistics systems is possible only thank cooperation focused on **compromise** based on the goodwill between all groups of interest.



**Thank you for your attention!**

Puławska S., Starowicz W.