

BESTUFS Conference

Barcelona 29-30 march 2001

**A method of Survey and Modelling to understand
the Urban Goods Movement**

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Plan

I - UGM : Objectives and Social Request

II - Methods, tools and results

III - Towards policy making ?



I - UGM : Objectives and Social Request

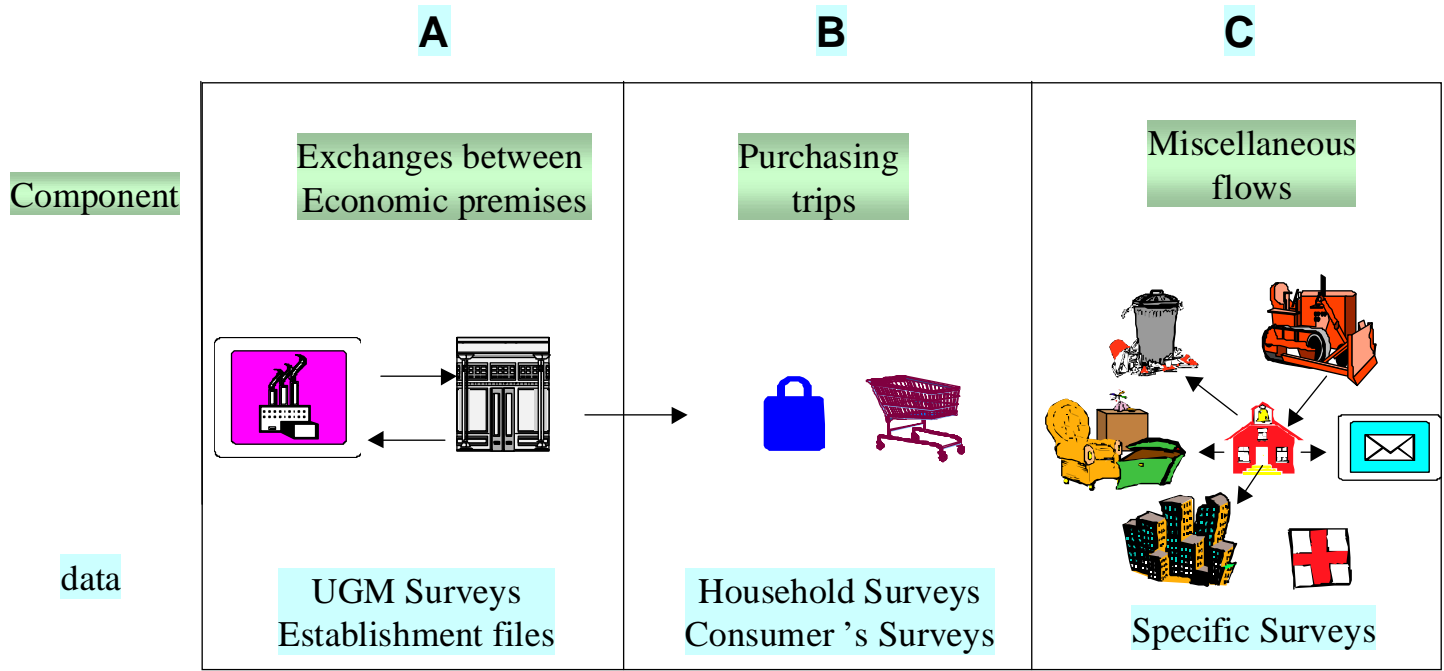
To define The Urban Goods Movement (UGM)

Stakes and methods history

Objectives



The Three components of UGM



Time sequence of stakes and main approach

Growth of road traffic →

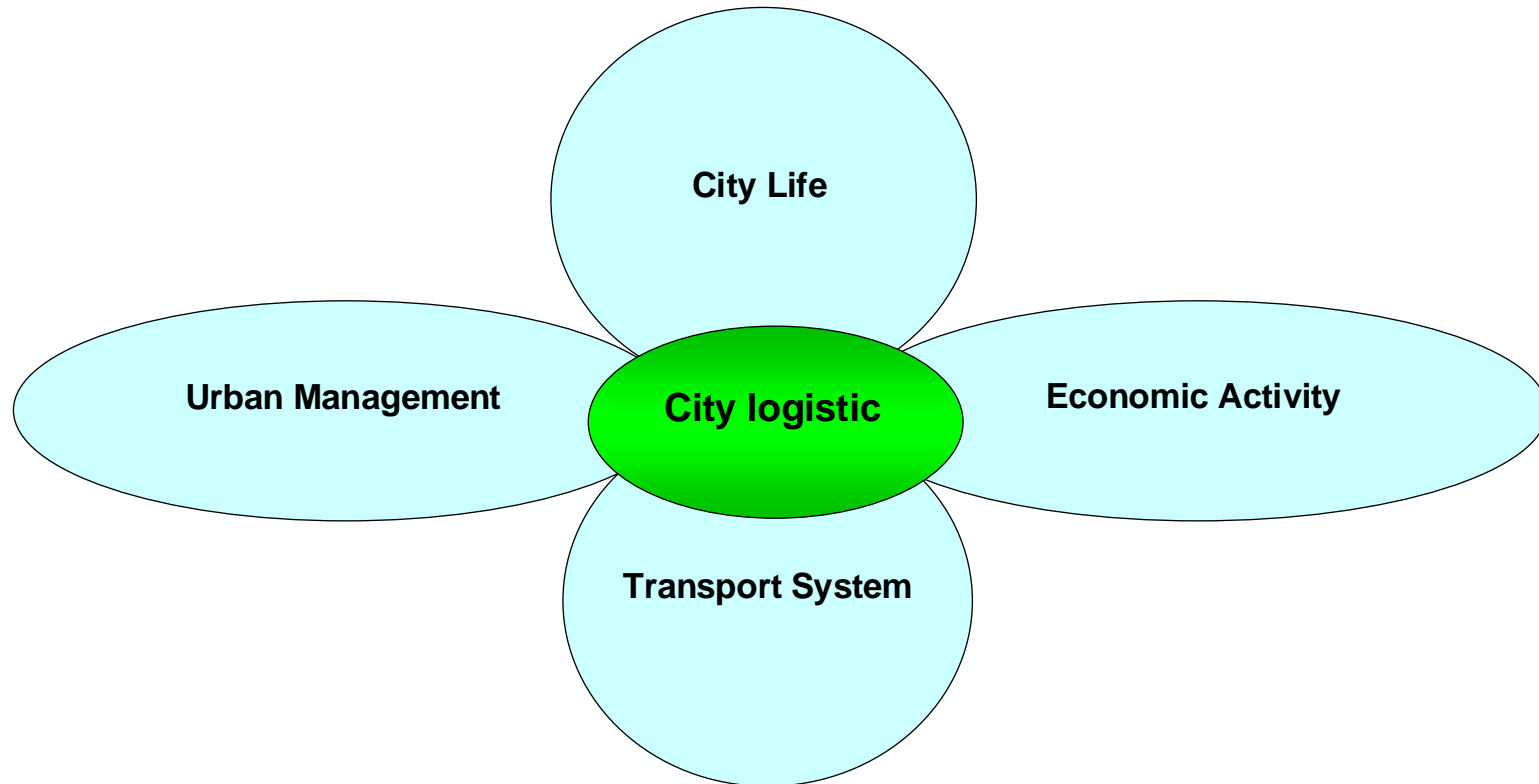
1975

1995

Stakes and social request	Infrastructure Building	Traffic management (congestion)	Control of urban growth (environmental nuisance)
Main approach	Economic	Engineering	System analysis
Models	Cost/benefit methods	4 steps models optimisation	Simulation of sustainable urban policy
Horizon	Short/medium terms	Short terms	Medium/long term



UGM in the Urban System



Three main objectives

I - to describe and explain

- flows of commercial vehicles in cities without large surveys),
- the part of the actors (firms, hauliers, consignors and consignees)

II - To assess

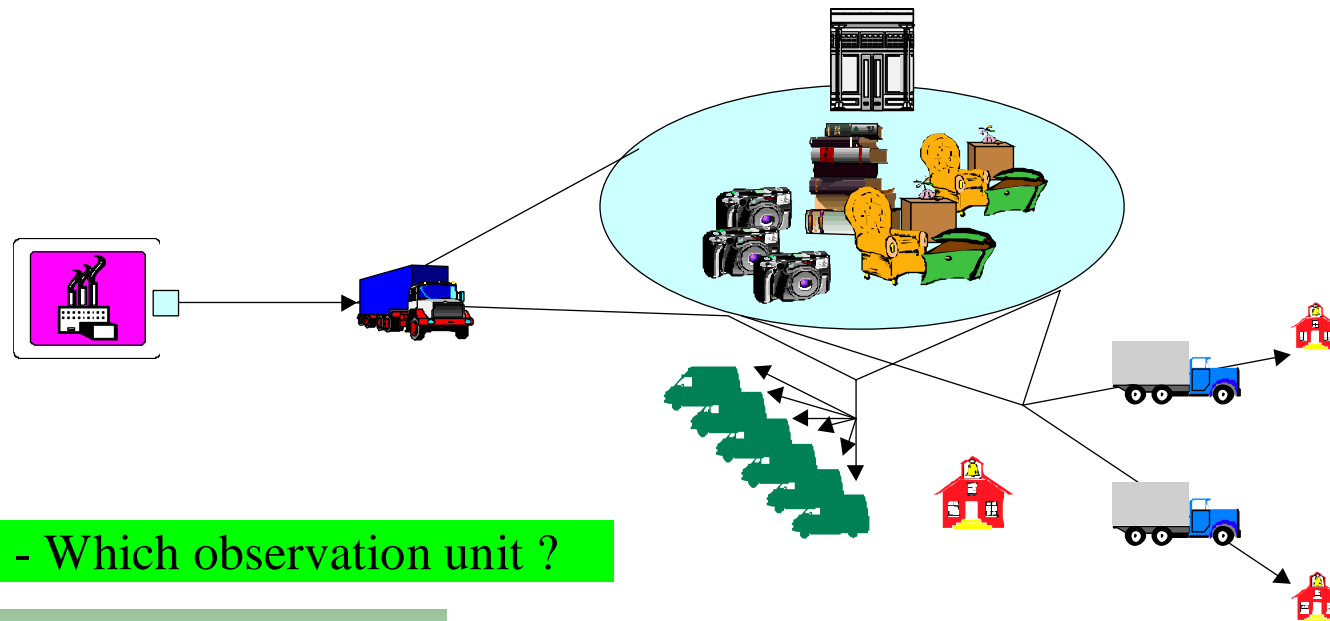
- on a zoning of the city :
- pick-ups/deliveries amount
 - road occupancy of goods vehicles

III - To simulate

- the impact of urban logistic, activity location, urban planning and regulation actions



Whitch Method to resolve complexity of UGM



- Which observation unit ?

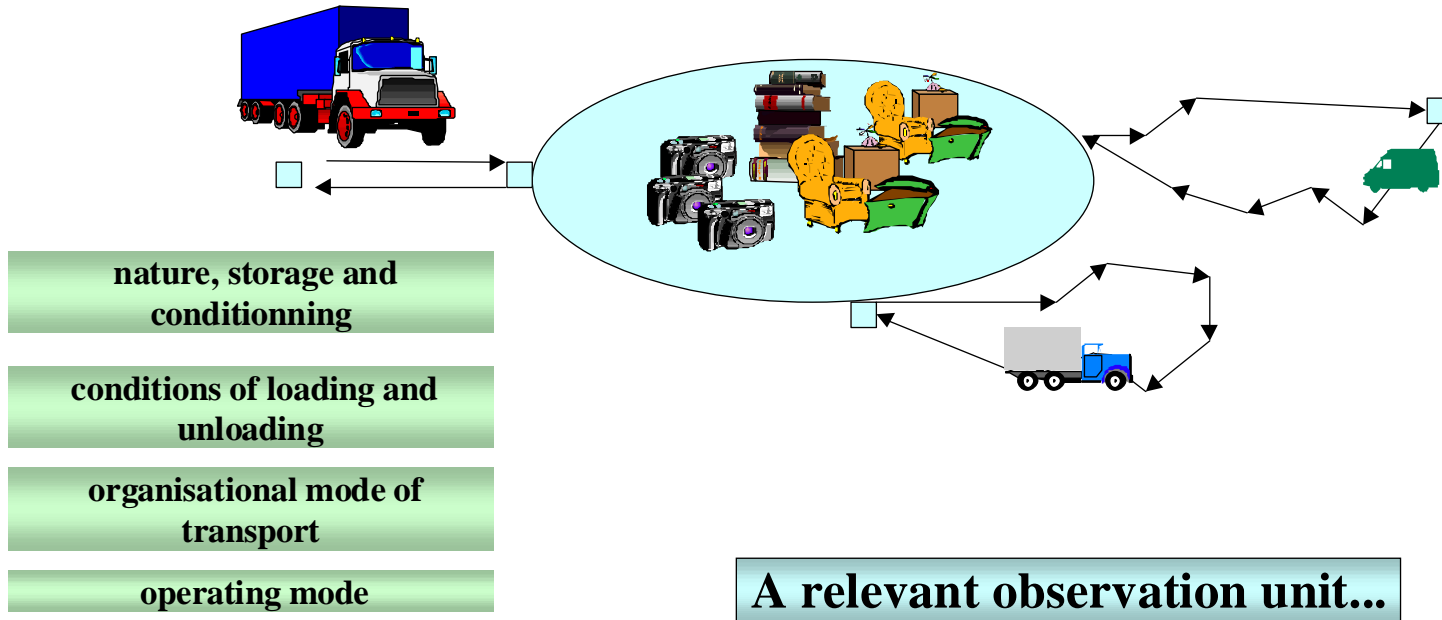
Origin/destination
of Goods ?

Movement of vehicle ?

Road section ?



Goods pick-up or delivery



**...To evaluate the number of pick-up
or deliveries in a city zoning**

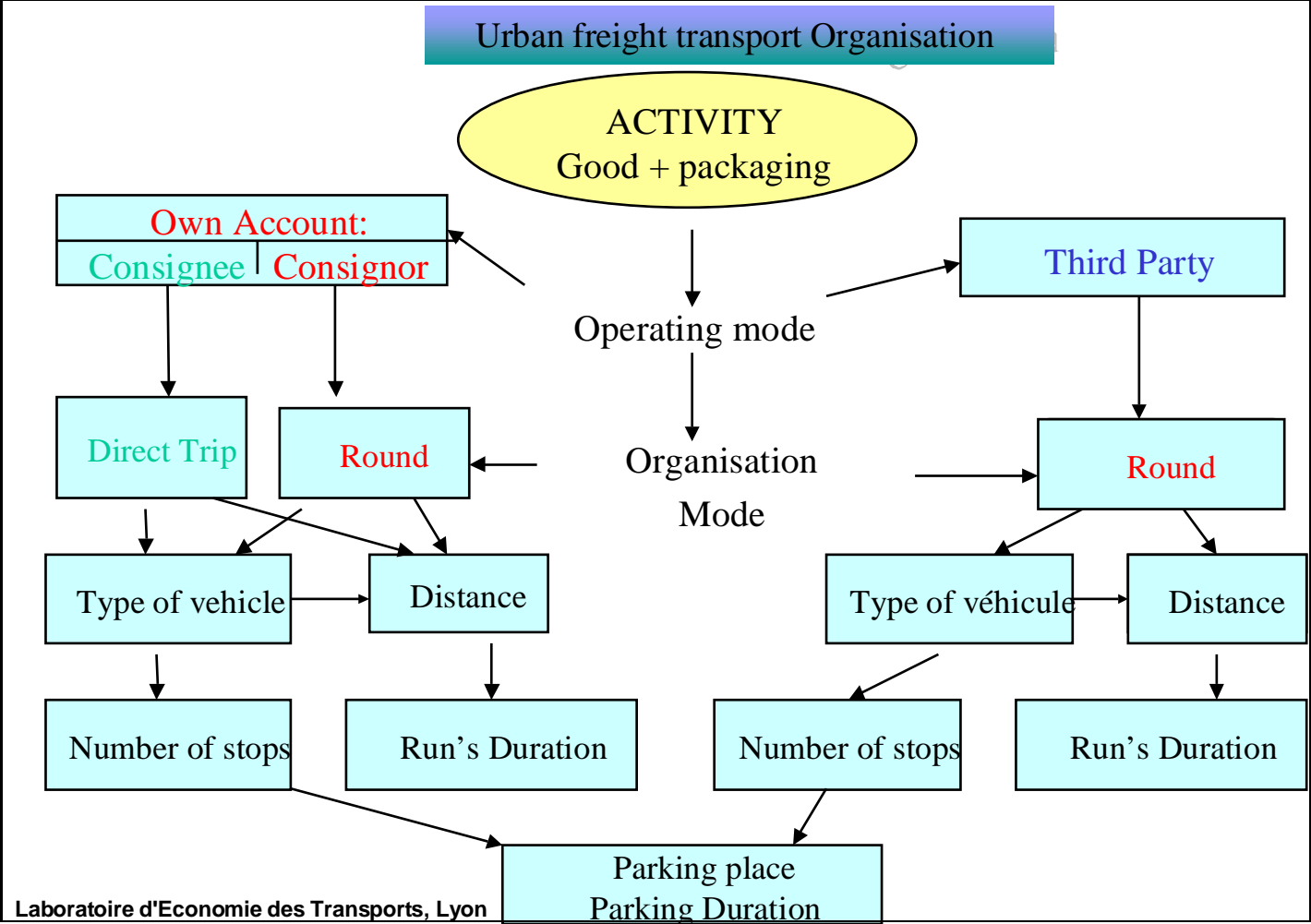
Allowing to calculate:

vehicle mileage

parking duration

and hourly pattern of UGM





Three surveys

In each city :

-a survey near the shipping or receiving goods establishments
(4300 establishments, describing 12000 pick-ups or deliveries)

-a second survey near drivers having delivered these establishments.
(2200 drivers)

-in one of the cities a third survey near the main haulage companies
(79 hauliers)



Surveys

I - To Describe

* **pick-ups/deliveries generation**

* **flows formation :**

- **which operating mode ?**

- **which organisation ?**



Surveys

some invariant results

- * **75% of operations by rounds**
- * **75% of tours are single trips**
- * **over 50% of own account**
- * **50% of less than 3,5 tons vehicles**



Three surveys

some relevant links

- * **Activity determines the number of pick- ups or deliveries**
- * **Transport chain organisation is connected with :**
 - **operating mode,**
 - **type of activity.**
- * **Distance covered depends on operating mode and density of each area**
- * **Double parking duration depends on :**
 - **type of vehicle,**
 - **number of stops of the round,**
 - **density of each area.**



An analogic model



**Determination of
Characteristic variables**

II - To Measure

1* The amount of pick-ups/deliveries on a zoning

**2-3* Road occupancy (hours*vehicles,
km*vehicles)**

4* peak periods per vehicle in a zoning



1 - generation

The number of pick-up/deliveries of a premise depends of :

- its activity (*industry, craft, wholesale, large volume distribution, retailers, tertiary, warehousing*)

- its nature : (*warehouse, hypermarket, plant, workshop, store*)

→ **45 activity types**

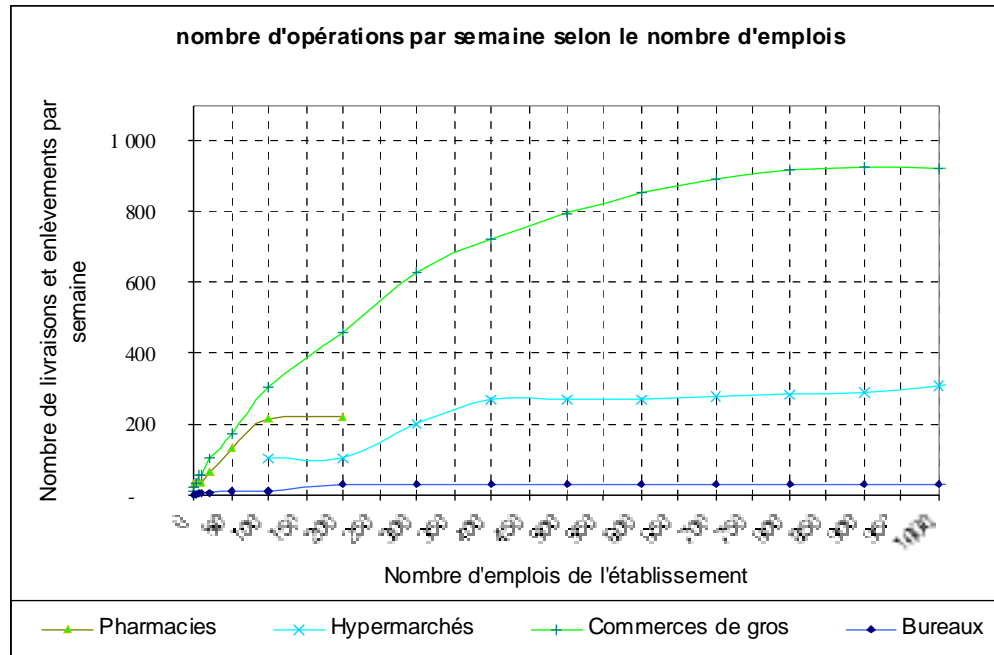
- the size of the establishment :

→ **116 premises types**

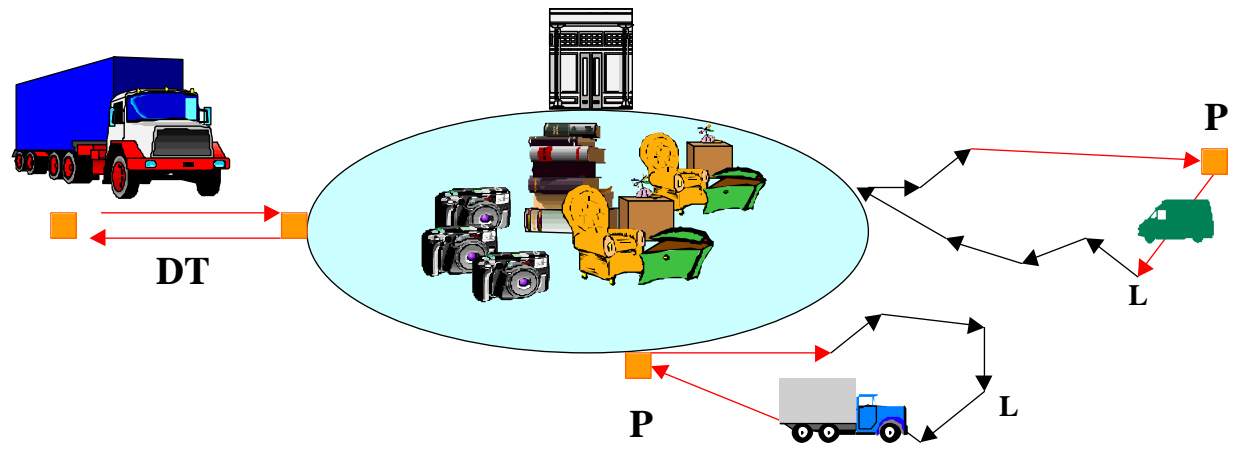


1 - pick-ups/deliveries generation

Généré pick-ups/deliveries by each establishment (example)



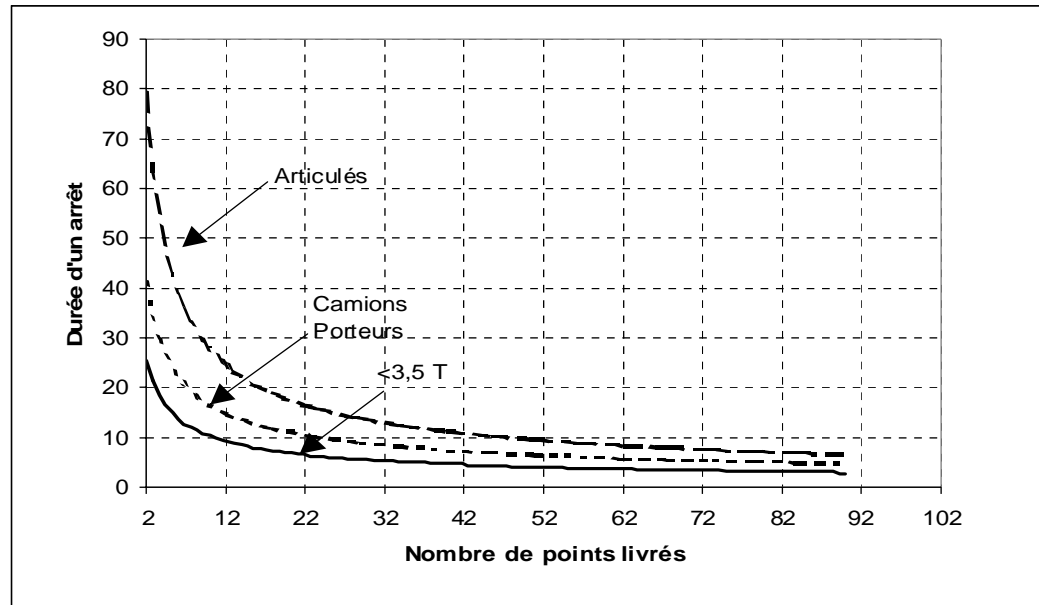
2 - Road occupancy



2 - Road occupancy by parking vehicles

Parking duration depends on :

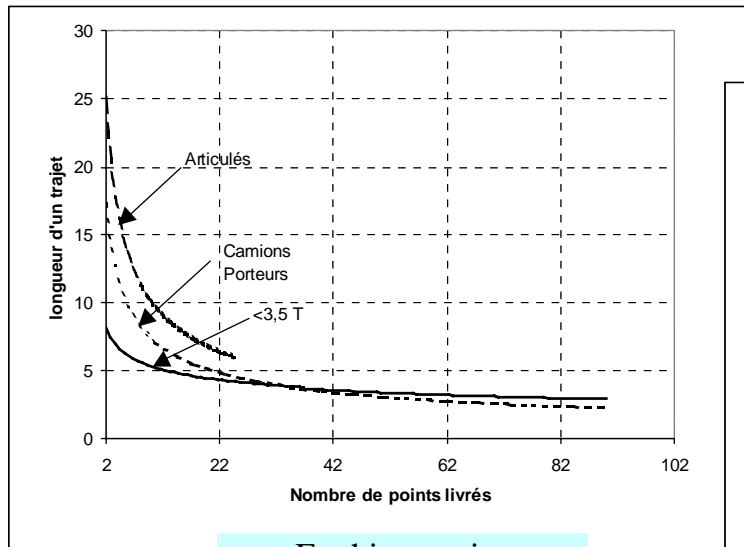
- stops number of each run,
- vehicle size.



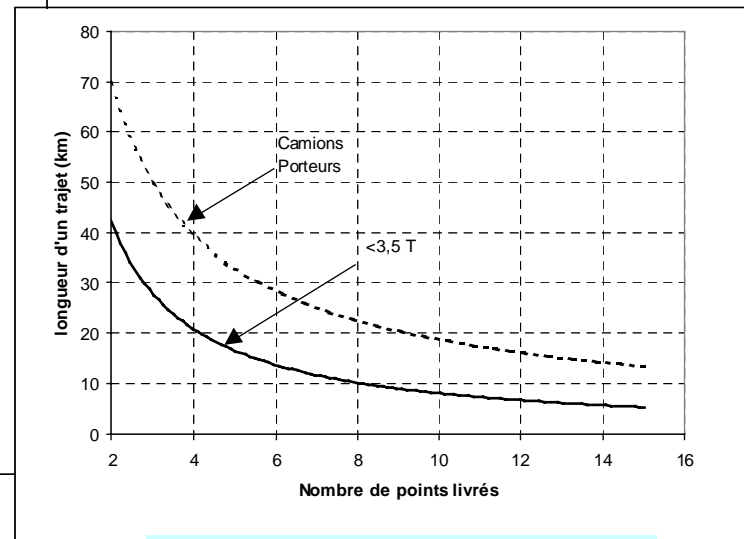
3 - Road occupancy by running vehicles

Distance covered between two stops depends on :

- number of stops of each run,
- vehicle type,
- operating mode
- density



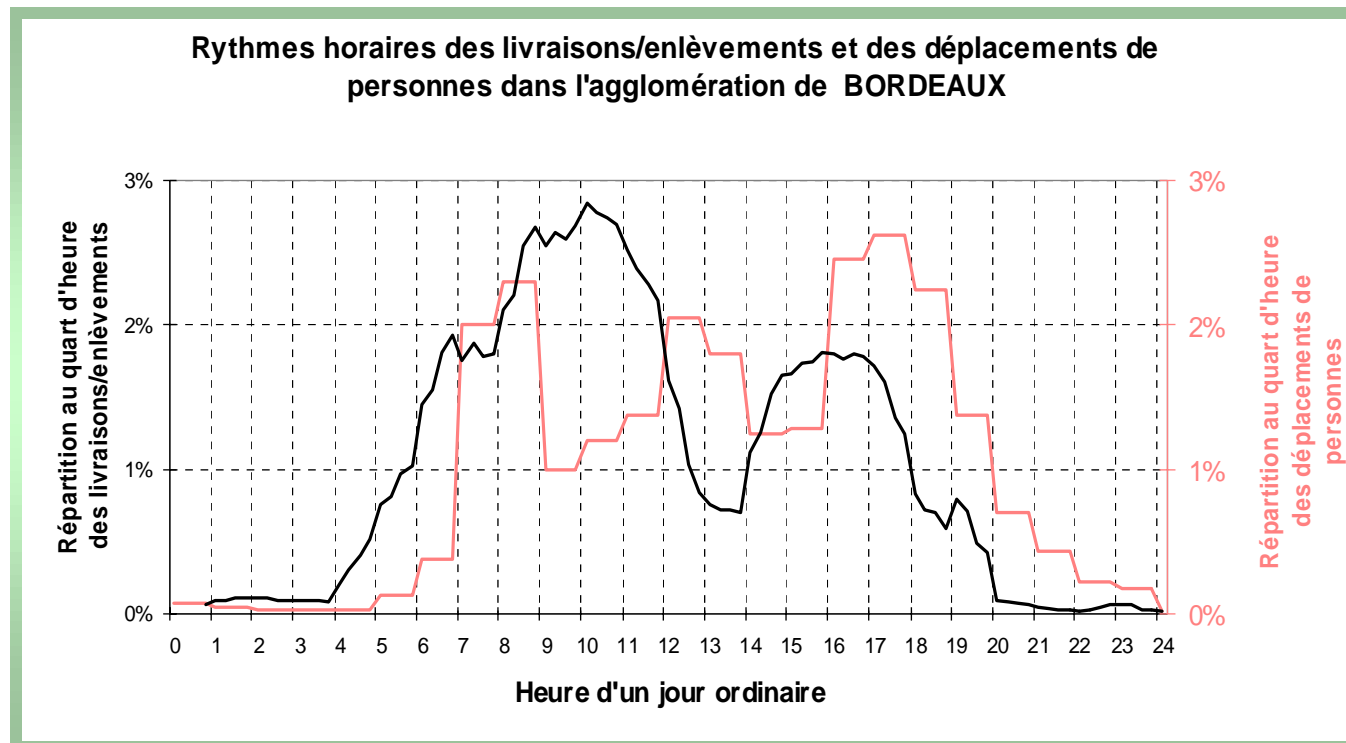
For hire service



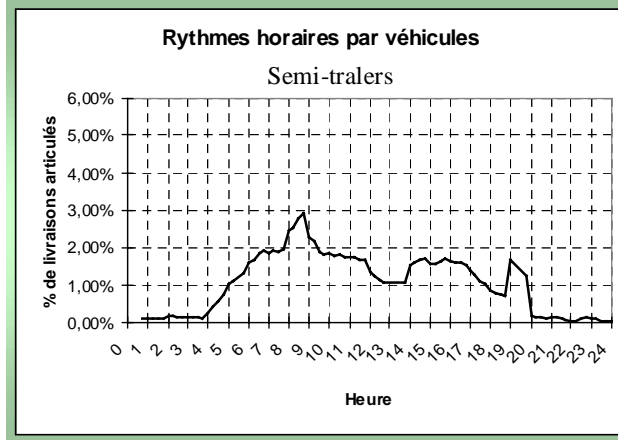
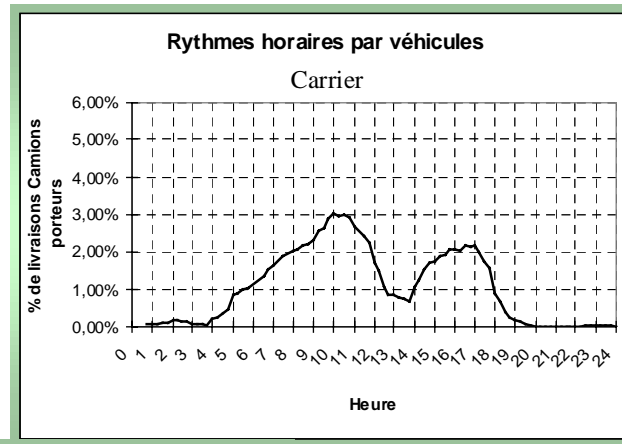
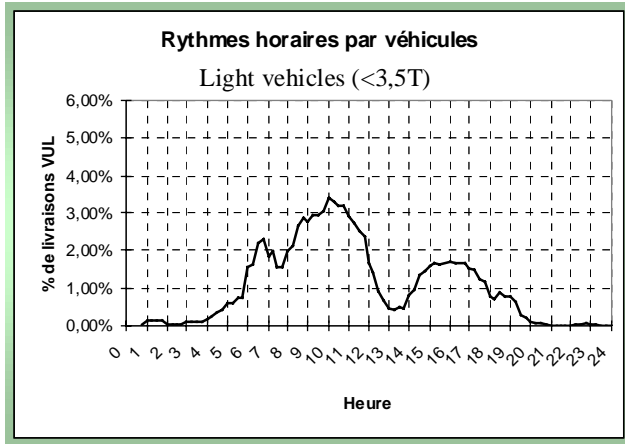
Consignee own account



4 - Hourly pattern of pick-ups-deliveries



4 - Hourly pattern of pick-ups-deliveries



An analogic model

III To simulate

The outcome of policy measures on :

- road occupancy (road congestion, economy)
- environmental nuisance

By changing sensitivity variables



To simulate the effects of :

Actions on Logistic System

Activities Location Scenarios

Regulation

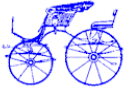
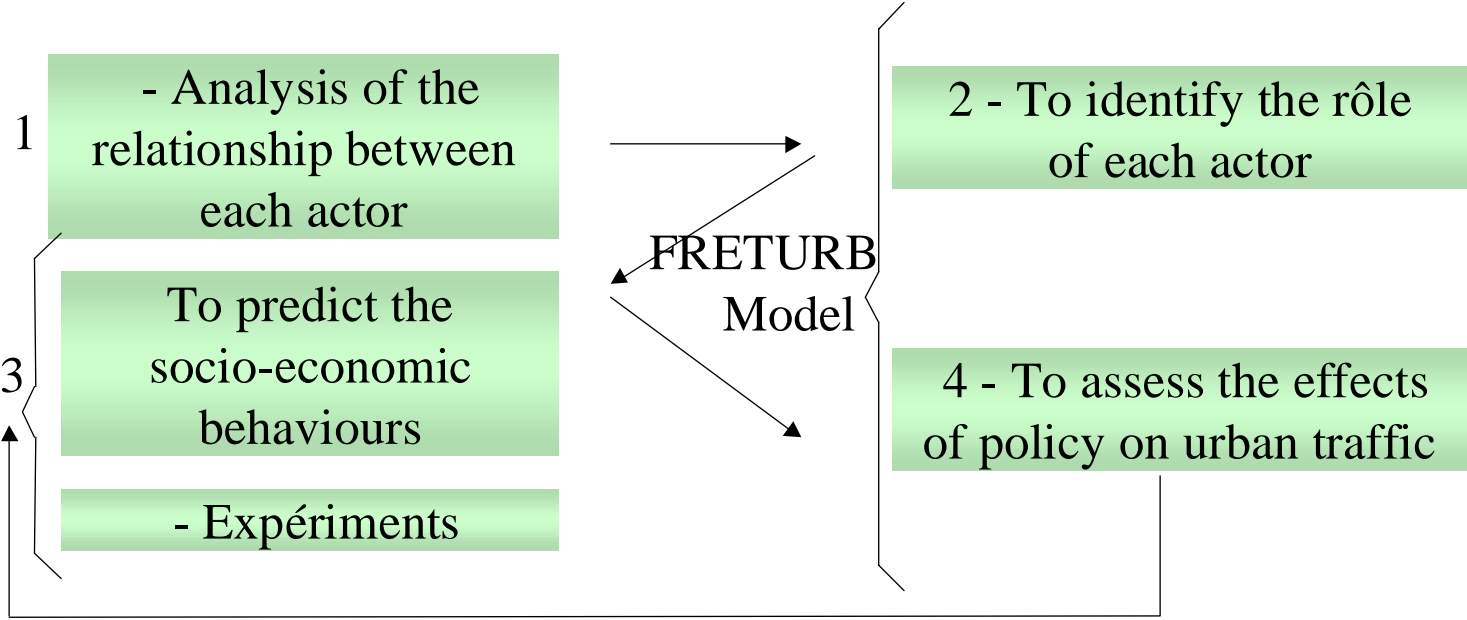
Urban Planning



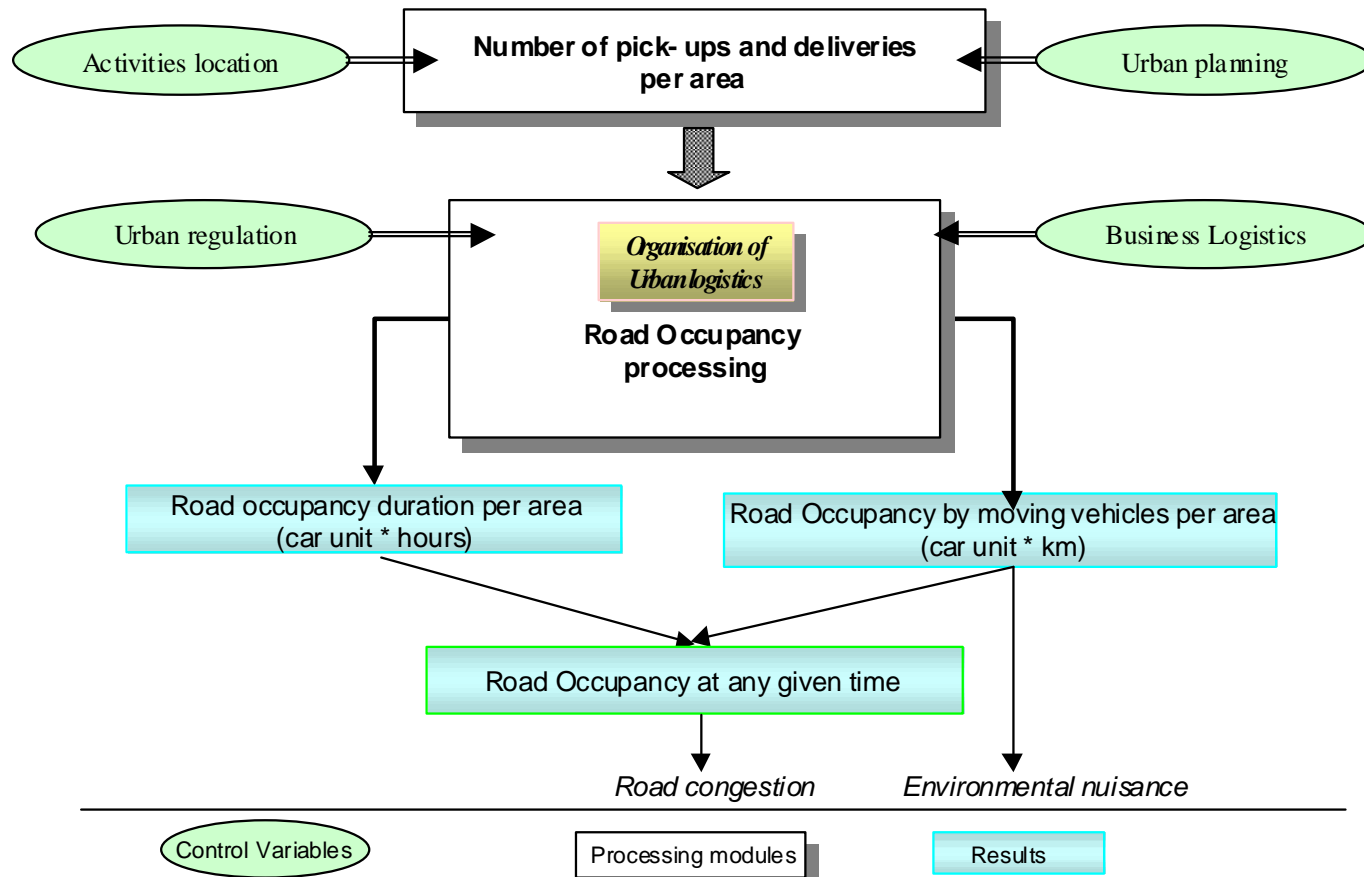
Simulation steps

Upstream models

Down stream model

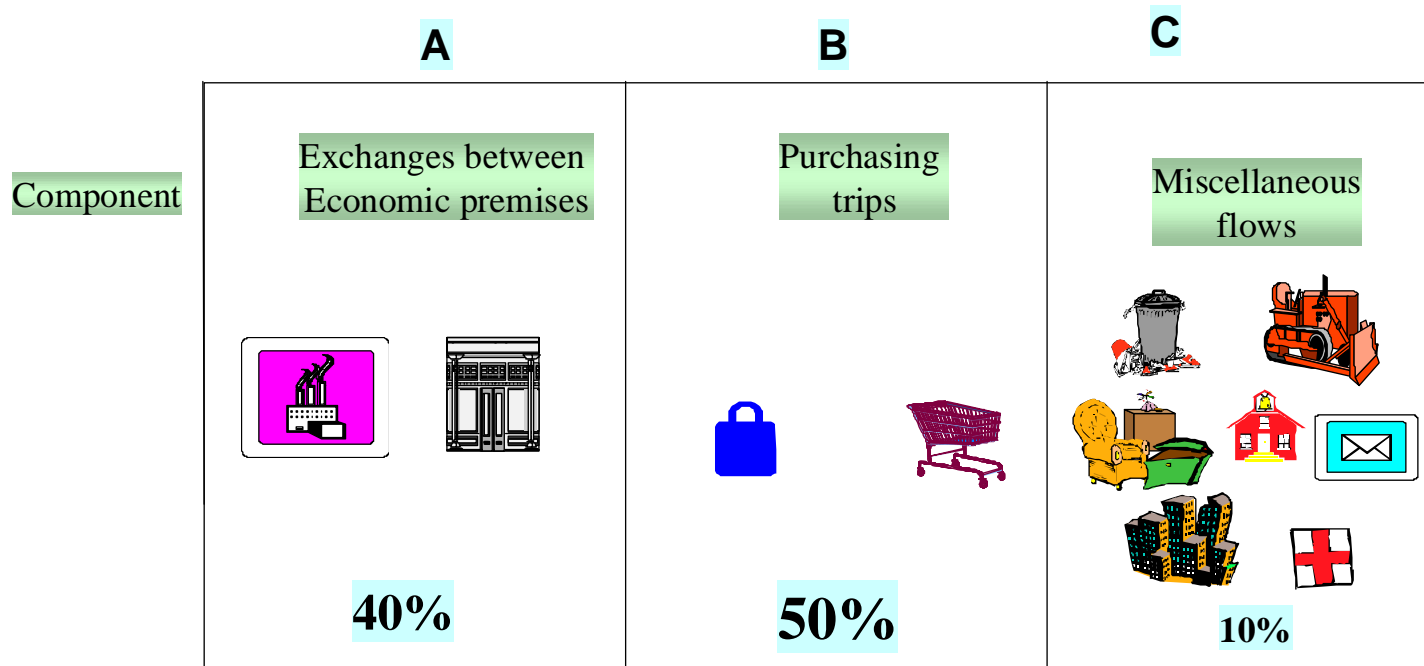


FRETURB :
A model for Urban Freight Transport simulation



Results

The Size of the Three components of UGM
(in km-car-unit)



Results

An example

Promotion of a vehicle which fit on express parcels services :

- improving loading and unloading ->
- réduction of on street double parking (1/2) ->
 - saving of 1,5 minutes at each stop
 - greater rounds ->
 - thus shorter trips.



Promotion of a vehicle which fit on express parcels services :

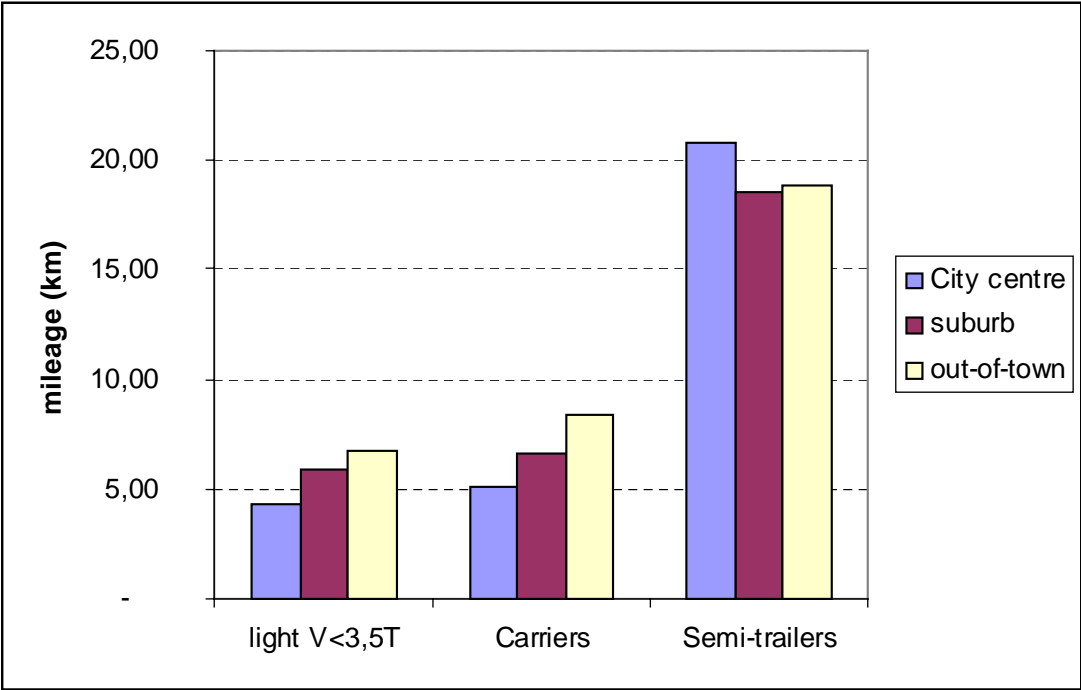
Results of the model :

- * **10%** of pick-ups/deliveries are involved
- * **A weak impact on illicit parking duration :**
 - a decrease of **1,8%** of double parking duration on the whole city (100 Hours/day),
 - a decrease of **2,5%** in City centre (50 Hours/day)
- * **A significant decrease (10%) of express parcels services mileage.** (1500 km.car-unit/day)



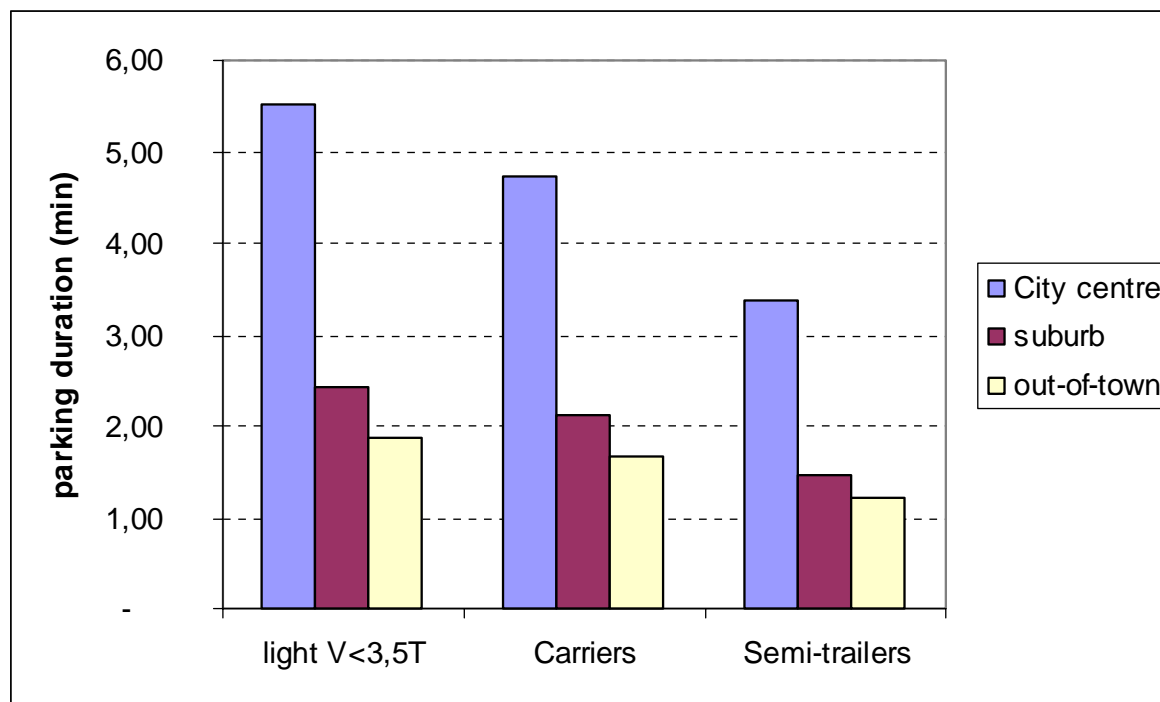
Some results

mileage average for one operation



Some results

Double parking duration of a delivery



The END