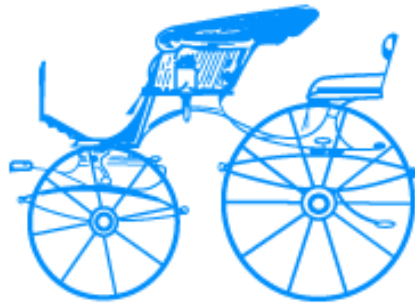
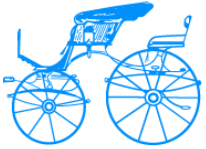


Traffic and CO₂ emissions of urban goods deliveries under contrasted scenarios of retail location and distribution



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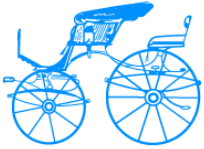
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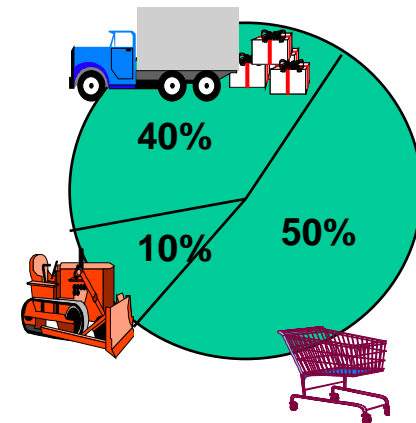
Plan

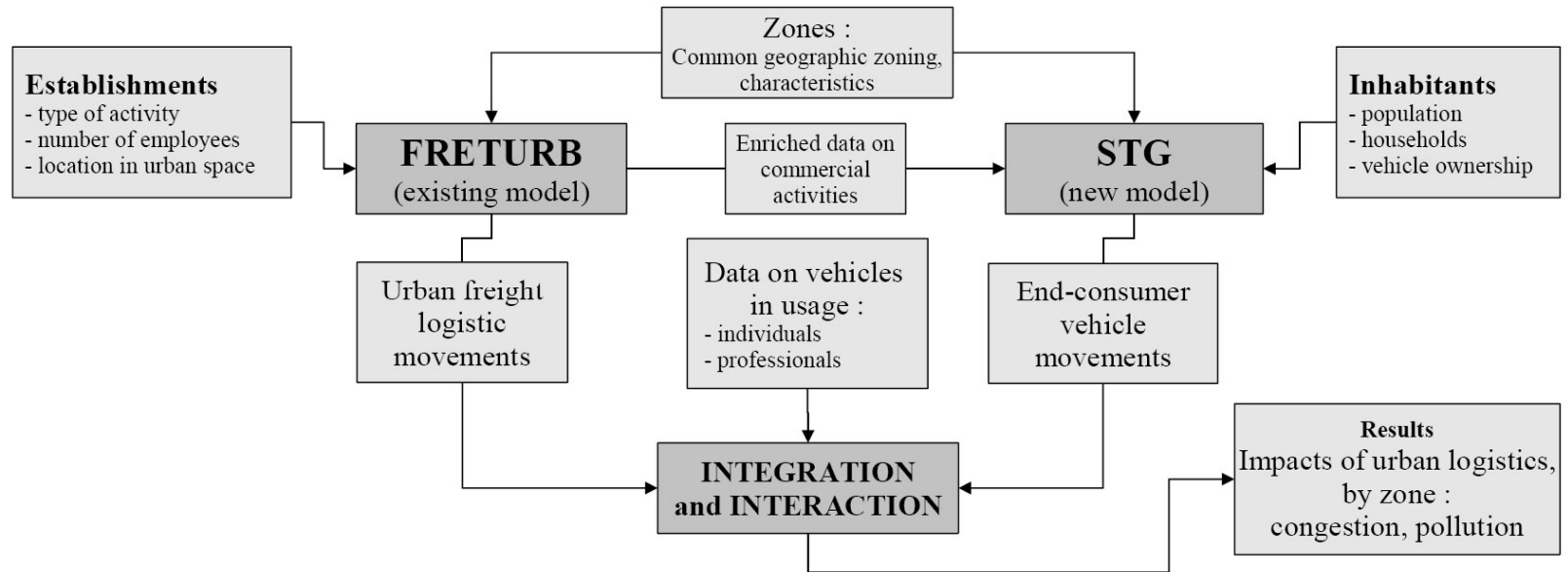
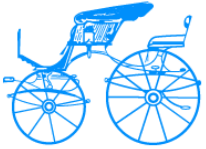
- Introduction
- Methodology
- Contrasted scenarios
- Traffic and greenhouse gas emission impacts
- Progressive scenarios for proximity deliveries
- Comparative results
- Conclusion

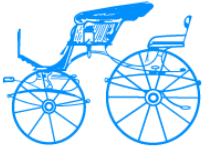


- **Main categories of motorized urban freight flows (LET, 2001)**
 - Freight distribution deliveries and pickup trips
 - End-consumer movements (purchasing trips by car)
 - Urban management flows

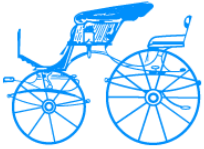
- Respect to the total traffic flows in a city, urban freight flows represent about 20% of the Km.PCU and 25% of greenhouse gas emissions (LET, 2006)







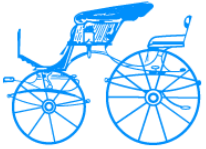
- Scenarios 1 and 2: extreme urban commercial areas
 - Conversion tables from survey data (Patier et al., 1999; LET, 2008)
 - Scenario 1: The commercial supply is supposed to be concentrated in 15 big peripheral commercial centres
 - Scenario 2: Only proximity stores are hypothesised
- Scenarios 3 and 4: extreme proximity delivery services
 - Alligier (2007) determined the main characteristics of home delivery routes in France
 - We suppose 15 distribution depots, instead of current hypermarkets and big surfaces
 - Scenario 3: All the freight is delivered to the households by a similar system as nowadays
 - Scenario 4: Small stores can serve as delivery points were people can take their commands



Estimation of impacts

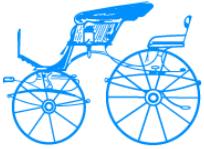
	Km.PCU IEM	Km.PCU IEM	Km.PCU TOTAL	CO2 equivalent
Reference	2,7 Mkm/week	26 Mkm/week	28,7 Mkm/week	6150 t/week
All Hypermarkets	-87%	-3%	-11%	-16%
All proximity stores	+90%	-87%	-63%	-56%
All home deliveries	-87%	-85%	-85%	-86%
All pickup points	-87%	-95%	-93%	-92%

Km-UVP : 1 ligh vehicle = 1,5 cars; 1 truck = 2 cars ; 1 truck-trailer = 2,5 cars



Progressive scenarios

- Non-collaborative distribution
- From 10 to 100% e-commerce usage
- Three scenarios:
 - Current e-commerce trends
 - Only home-delivery
 - Only Pickup points
- Results in km.PCU (only proximity ECM)

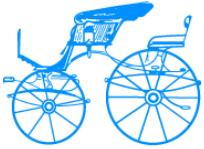


Comparative results

Scénario		Aval Livraison	Aval Achats	Total
0		0	25955939	25955939
LAD	10%	4%	-10%	-6%
	20%	8%	-20%	-12%
	30%	13%	-31%	-18%
	40%	17%	-42%	-25%
	50%	21%	-52%	-31%
	60%	25%	-63%	-38%
	70%	29%	-74%	-44%
	80%	33%	-84%	-51%
	90%	38%	-95%	-57%
	100%	40%	-100%	-60%
PR	10%	2%	-8%	-6%
	20%	4%	-17%	-13%
	30%	6%	-26%	-20%
	40%	7%	-34%	-27%
	50%	9%	-43%	-34%
	60%	11%	-52%	-41%
	70%	13%	-61%	-48%
	80%	15%	-70%	-55%
	90%	17%	-79%	-62%
	100%	18%	-82%	-65%

Km-UVP : 1 VUL = 1,5 VP ; 1 Camion porteur = 2 VP ; 1 articulé = 2,5 VP

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Conclusions and future developments

- Extreme scenarios : limits of land-use and distribution policies
- « Physical » approach : economic and social costs have not been directly evaluated
- Only the last km considered : need to extend to all the urban goods movement field
- Need of good quality data for both shopping trip and proximity distribution characterisation
- Future developments:
 - Modeling issues (distribution and modal part)
 - More realistic scenarios
 - Socio-economic issues (economic and social costs)
 - Proximity deliveries simulation