

Last mile logistics

**E-Commerce and its impact on transport in urban areas and
Innovative approaches in city logistics
for solving the last mile issue**

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Last mile logistics

B2C-VERRA

B2C-E-Commerce:
Impact on transport in urban areas (2002-2004)

supported by the
German Federal Ministry of Education and Research (BMBF-FKZ 19M2017)
in collaboration with the City of Cologne

OPTIMAL

Strategies for optimizing Pick-up and Delivery traffic
of Internet Commerce – Packstations in Cologne (2005-2006)

supported by the
German Federal Ministry of Economics and Technology (BMW-FKZ 19G4042)
in cooperation with the Deutsche Post World Net, DHL
and the City of Cologne

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Data base of the study „B2C-VERRA“:

Trends in B2C E-Commerce / structure of internet consumers:
in general: other examinations / literature
in Cologne Region: consumer survey

Delivery concepts:

Interviews with B2C merchants, logistic providers
Workshops with B2C merchants, logistic providers

Acceptance of delivery concepts:

Consumer survey

Consumer survey:

Questionnaires to 15,000 households
1.600 returned questionnaires
0.1 % of relevant population

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Database OPTIMAL

- Research project OPTIMAL: supported by BMWi
- Conducted by KE-CONSULT in cooperation with Deutsche Post World Net, DHL and City of Cologne
- Estimating the effects for Cologne (2005)
- Empirical data base:
 - Customer survey of more than 1,200 users at eleven Packstations in Cologne
 - Data for all Cologne Packstations provided by Deutsche Post World Net, DHL
 - Current traffic data for the City of Cologne

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Trends in E-Commerce and Consequences for Express Courier:

- more parcels,
- subdivided parcels,
- increasing deliveries to end-customer:
 - lower potential for bundling,
 - increasing multiple deliveries,
 - lower stop-factor,
- rising costs of last mile logistics

Therefore: innovative concepts for solving the last mile issue are needed

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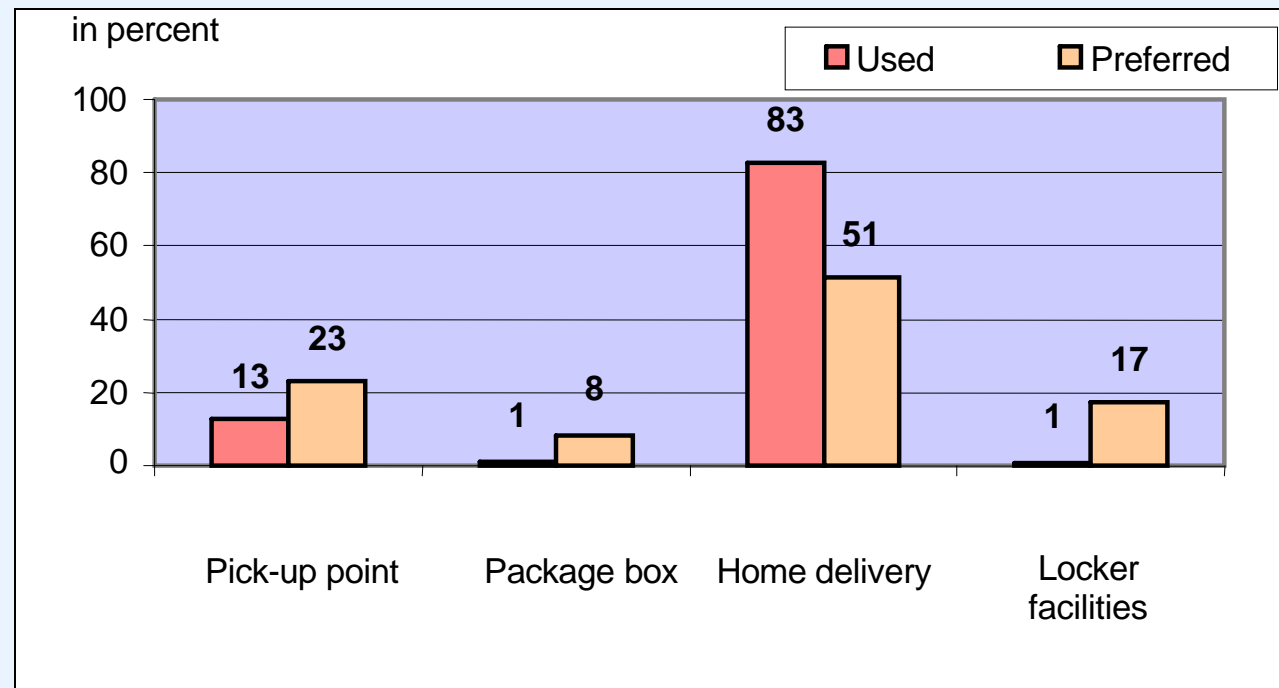
Delivery concepts:

- ✓ Conventional home delivery
- ✓ Pick-up points, such as filling stations or kiosks
- ✓ Package boxes for individual residential buildings
- ✓ Locker facilities in publicly accessible places

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Acceptance of delivery concepts:

Used and preferred delivery concepts



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Acceptance of delivery concepts:

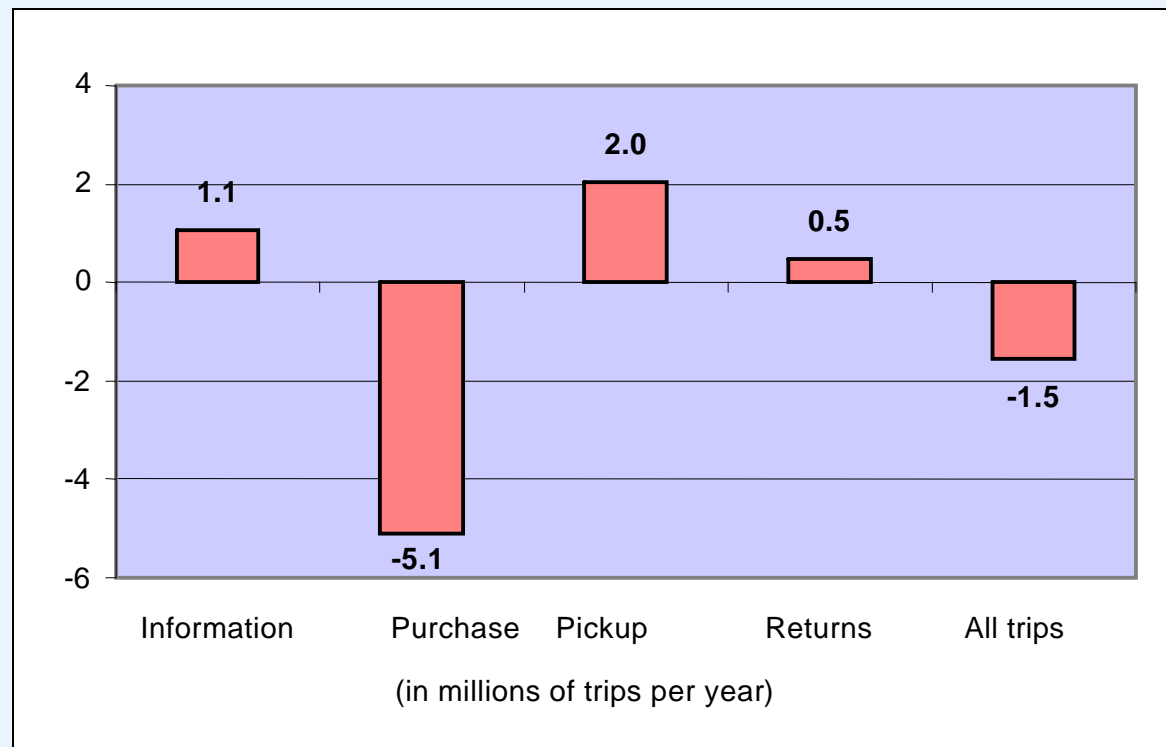
preferred delivery concepts by region

	Home delivery Package box	Pick-up point Locker facilities
Center city	39%	61%
Outer city	67%	33%
Suburbs	72%	28%

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Impact of E-Commerce and delivery concepts on transport in urban areas (Cologne 2003):

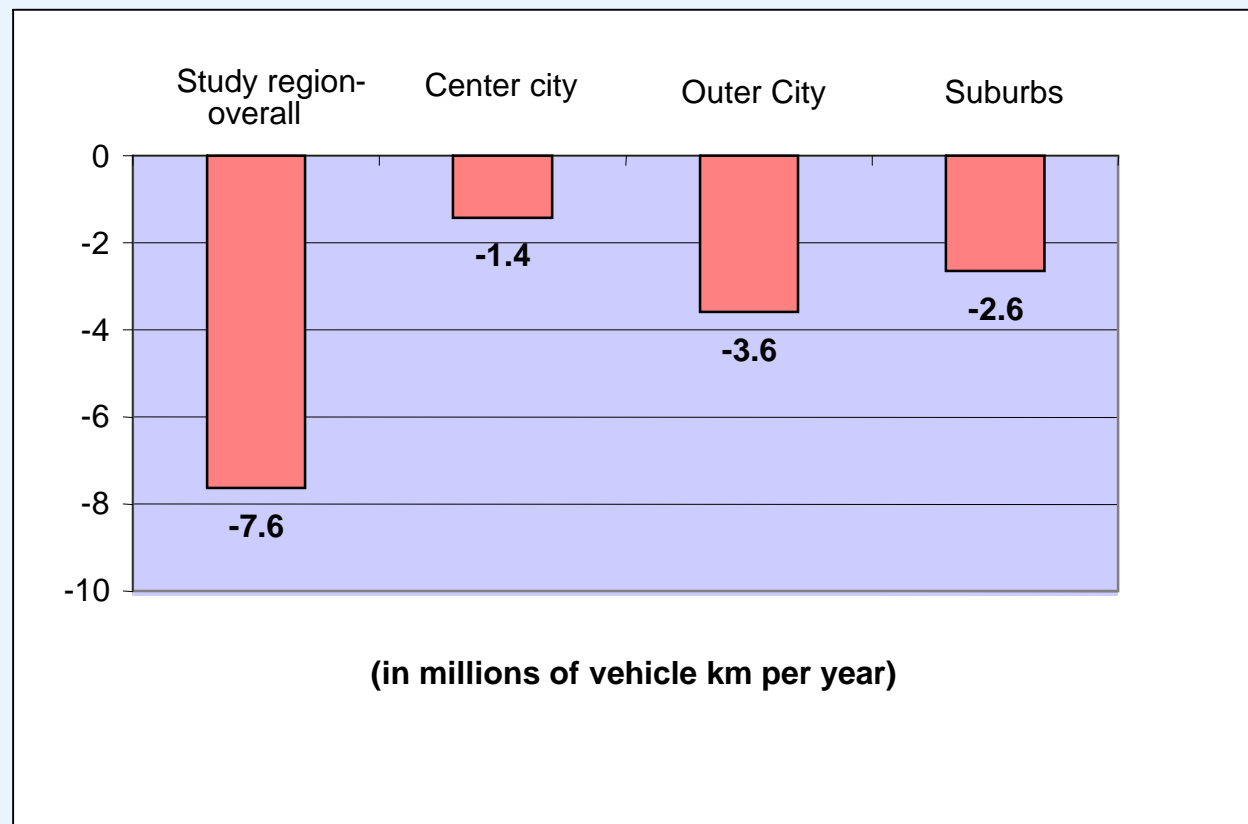
shopping traffic – trip balance



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Impact of E-Commerce and delivery concepts on transport in urban areas (Cologne 2003):

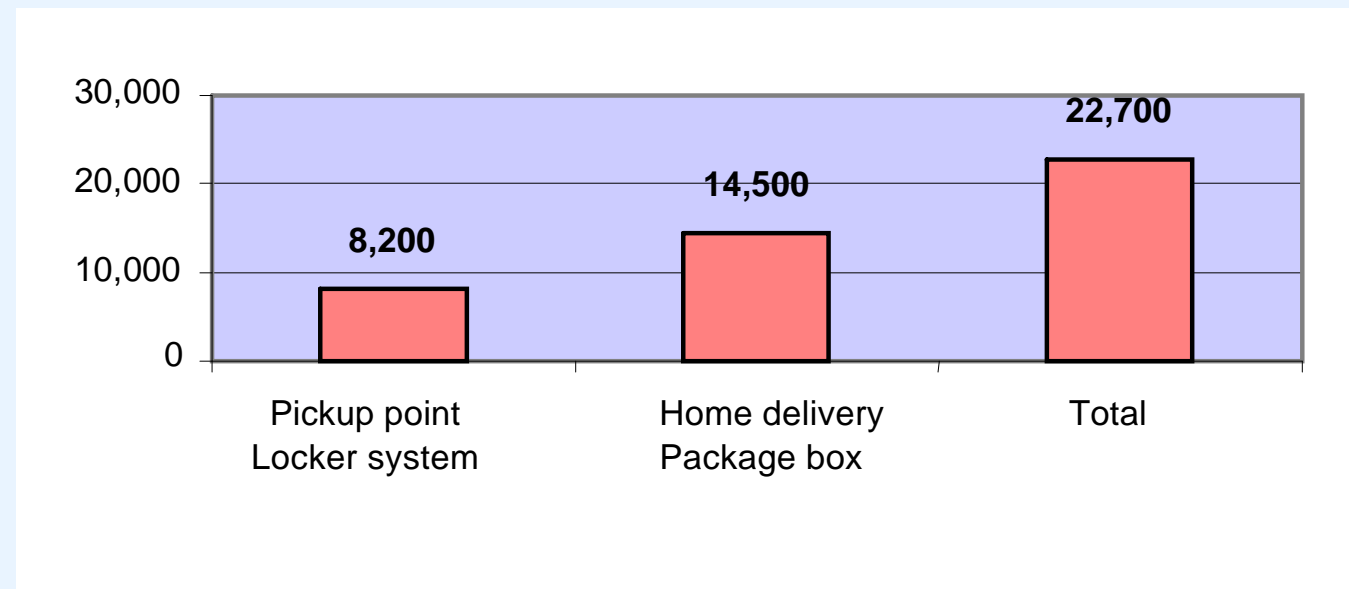
shopping traffic – reduced mileage in car traffic



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Impact of E-Commerce and delivery concepts on transport in urban areas (Cologne 2003):

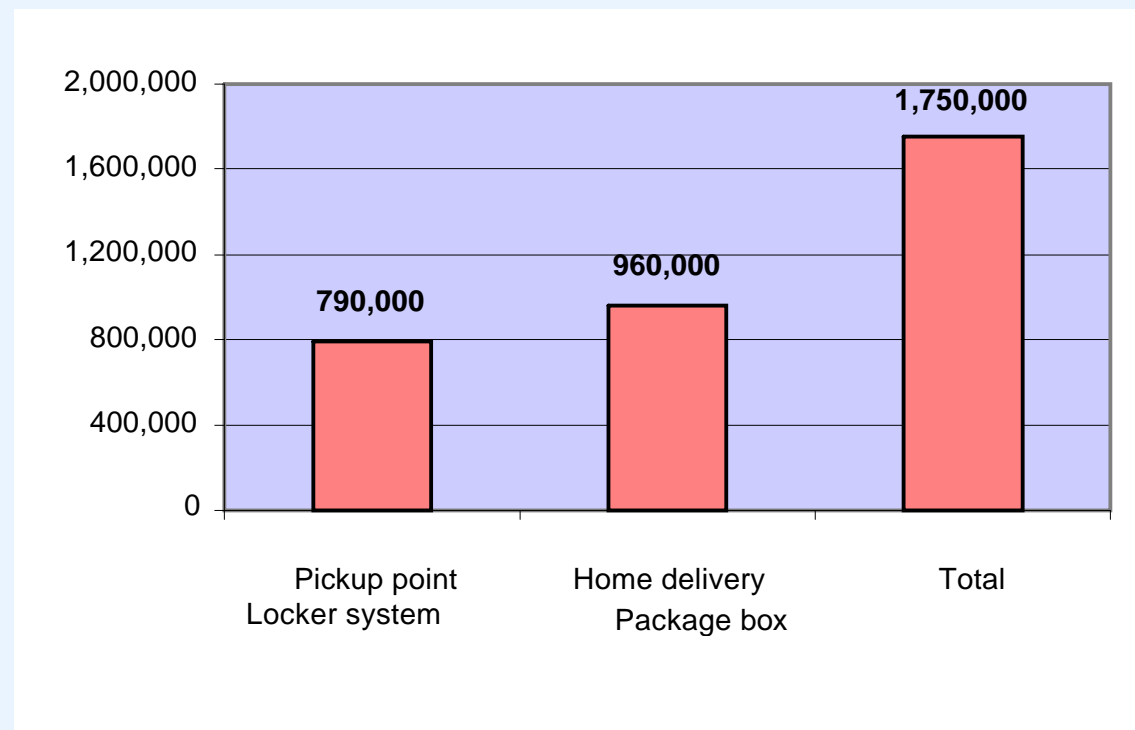
delivery traffic – delivery trips



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Impact of E-Commerce and delivery concepts on transport in urban areas (Cologne 2003):

delivery traffic – mileage



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Impact of E-Commerce and delivery concepts on transport in urban areas (Cologne 2003):

Synopsis of transport impacts

	Car traffic (mil. vehicle km)		Delivery traffic (mil. vehicle km)	
	2003	2006	2003	2006
Center city	-1.4	-2.5	+0.1	+0.2
Outer city	-3.6	-6.2	+0.9	+1.5
Suburbs	-2.6	-4.6	+0.8	+1.4
Region under study	-7.6	-13.3	+1.8	+3.1

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B2C E-Commerce results in

- ✓ Reduction of private shopping traffic (personal motor traffic, public transport) and increasing delivery traffic
- ✓ Reduction of demand for parking space in Cologne center city
- ✓ Traffic related problems at locker facilities and pick-up points
- ✓ Concentration of pick-up traffic in peak traffic periods (rush hour)

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Packstation –
an innovative concept solving the last mile issue



More than 700 Packstations in Germany (2006)

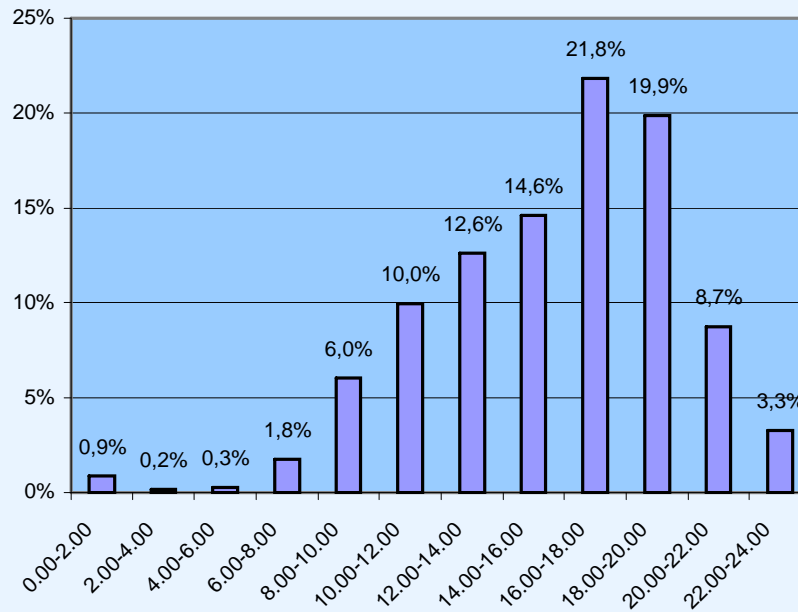
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Packstation – an innovative concept solving the last mile issue

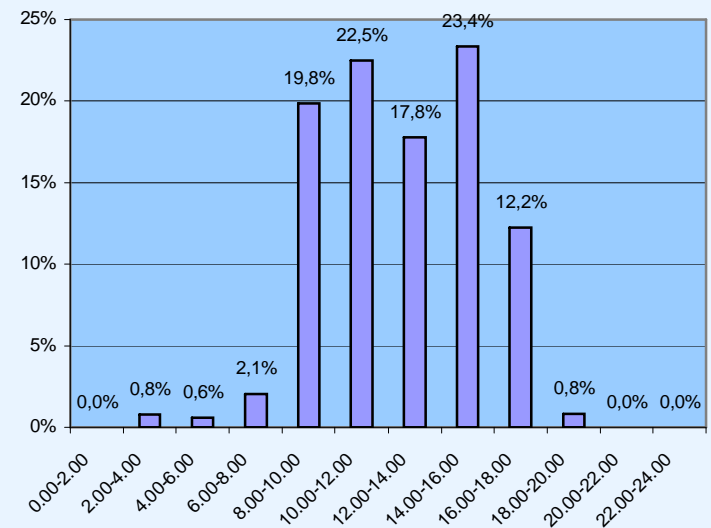
- Registered Packstation customers (**gold card customer**)
 - ...can receive postal packages at the Packstation for pick-up
 - ...can also send postal packages using the Packstations
- When a postal package recipient is not at home to accept delivery, the parcel is not deposited at a local post office but placed in a Packstation where the customer can pick it up (**green card customer**).
- **DHL** deposits postal packages at the Packstations to be picked up by customers (registered Packstation customers and green card customers) and collects the parcels sent from there by registered Packstation customers.

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Customer pick-ups – temporal distribution



Delivery traffic of DHL



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Evaluation of Packstation (I): impact on urban transport

- Alternatives to the gold card are the green card and the orange card (orange card: when a parcel recipient is not at home to accept delivery, the parcel is deposited at a local post office).
- The traffic volume per parcel is lowest for the registered Packstation customers.
- Green card customers have a higher traffic volume per parcel.
- The traffic volume per parcel is greatest with the orange card.

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Evaluation of Packstation (II): impact on urban transport

- Pick-up traffic is organized more efficiently.
- Customers achieve savings of time and costs.
- The trip volume is reduced by 54,000 trips and the traffic volume by around 80,000 km across all transport modes.
- The City of Cologne is relieved of around 35,000 vehicle kilometres of car traffic.
- The environmental impact of pick-up traffic (particulates, CO₂-emissions) is reduced. For example, CO₂-emissions are diminished by 8 tons.

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Effects in delivery traffic

- DHL can execute delivery trips more efficiently. This generates savings in time and costs.
- For Cologne, Packstations resulted in a reduction of vehicle delivery mileage of 7,000 vehicle kilometres in 2005.
- This leads to a reduction of CO₂-emissions in delivery traffic by about 3 tons. The particulate matter burden created through delivery trips can be reduced.