

# Internet-based Logistics Centre for Coordinated Transport in Stockholm

*The City of Stockholm, Sweden*

## Summary

The City of Stockholm set up a logistical centre for coordinated transports in the new city district Hammarby Sjöstad in the beginning of 2003. The aim is to reduce energy use and CO<sub>2</sub>-emissions through coordinated transports to the district residents, schools and other municipal service units, and private companies and restaurants operating in the area.

The centre is operated by the company Home Department AB and includes delivery of on-line purchased daily goods, dry cleaning services, and distribution of food and beverages. Furthermore it has the potential of becoming Sweden's first integrated distribution system for locally produced food directly from approximately 300 local farmers. Feasibility studies based on surveys of attitudes showed a great interest in using the logistics centre. Besides the reduced environmental impact of transports, other external positive effects include enhanced traffic security, an increased level of service for residents, and improved availability for locally produced food.

End-user area	Target Audience	Technical
<input type="checkbox"/> New buildings	<input checked="" type="checkbox"/> Citizens	<input checked="" type="checkbox"/> Energy efficiency
<input type="checkbox"/> Refurbishment of buildings	<input type="checkbox"/> Households	<input type="checkbox"/> Heating
<input checked="" type="checkbox"/> Transport and mobility	<input type="checkbox"/> Property owners	<input type="checkbox"/> Cooling
<input type="checkbox"/> Financial instruments	<input type="checkbox"/> Schools and universities	<input type="checkbox"/> Appliances
<input type="checkbox"/> Industry	<input type="checkbox"/> Decision makers	<input type="checkbox"/> Lighting
<input type="checkbox"/> Legal initiatives (municipal regulations, directives, etc)	<input checked="" type="checkbox"/> Local and regional authorities	<input type="checkbox"/> CHP
<input checked="" type="checkbox"/> Planning issues	<input type="checkbox"/> Transport companies	<input type="checkbox"/> District Heating
<input checked="" type="checkbox"/> Sustainable communities	<input type="checkbox"/> Utilities	<input type="checkbox"/> Solar energy
<input checked="" type="checkbox"/> User behaviour	<input type="checkbox"/> ESCOs	<input type="checkbox"/> Biomass
<input type="checkbox"/> Education	<input type="checkbox"/> Architects and engineers	<input type="checkbox"/> Wind
<input type="checkbox"/> Other	<input type="checkbox"/> Financial institutions	<input type="checkbox"/> Geothermal
	<input type="checkbox"/> Other	<input type="checkbox"/> Hydro power
		<input type="checkbox"/> Other

## Context

Hammarby Sjöstad is the largest Swedish ongoing city development programme. An old worn-down harbour and industrial area is transformed to a new modern residential city district. Already 2 200 new apartments have been erected, when this new city district is finalized in 2012 it will contain 8 000 apartments for 20 000 residents. In addition to this approximately 10 000 persons will be working in the district. The City of Stockholm's environmental goal for Hammarby Sjöstad is that all new buildings and infrastructure solutions should be twice as good as best available technology (in comparison with the year 1990).

The infrastructure of Hammarby Sjöstad is planned and built with the aim to reduce traffic, which in practice means a road network with limited access for transport. In order to reduce the need for private cars a variety of public transport services is available in the area – trains, boats and buses – as well as pedestrian and bicycle routes and access to car-pooling. Furthermore, the area is under construction, which means that it will take time before the residents can enjoy full service in terms of shops and other facilities.

## **Objectives**

The City of Stockholm took on the challenge of developing existing and new logistic services in the Hammarby Sjöstad district in order to reduce emissions from transport to and within the area and at the same time contribute to cost-effective solutions for local residents, business and municipal service providers.

## **Process**

**Residential logistics.** Private transports account for high energy use; in 2001 private transport of everyday commodities accounted for 5 TWh in Sweden. Given the infrastructural conditions in Hammarby Sjöstad, it was assumed that the residents might be interested in having on-line purchased groceries and other everyday commodities delivered to their homes. It was also assumed that the people moving in to a new environment would be more likely to adopt new habits. It was assumed that the chance of obtaining a more rapid increase in on-line shopping for everyday commodities was considerably larger in a new residential area like Hammarby Sjöstad, than in the country as a whole.

**Simulations.** One method of co-ordinating transports was to create a logistics centre – a central point to which different goods, purchased on the Internet, was to be delivered. The goods were then to be distributed locally to the customers by means of clean eco-vehicles. Initially a simulation of environmental impact of transport of purchased daily goods for the residents in Hammarby Sjöstad was carried out. Four different scenarios were calculated for 2 200 and 8 000 households, corresponding to the number of households in Hammarby Sjöstad at the end of 2002 and when the building constructions of the new city district will be finalised in 2012. The scenarios propose different shares of on-line shopping: 0, 10, 25 and 50 %. Each scenario contains six cases, depending on whether on-line shopping concerns shopping from regular household goods retailers or e-business warehouses, and whether transport occurs with or without coordination. For each case, the energy consumption, traffic and emissions of CO<sub>2</sub>, CO, NO<sub>x</sub>, HC and particles were calculated depending on whether on-line shopping concerns shopping from regular household, goods retailer or e-business warehouses, and whether transport occurs with or without coordination. The simulations show that on-line shopping with coordinated transports and a penetration level at 10 percent of purchased daily household goods in the area could reduce energy use, CO<sub>2</sub> emissions and NO<sub>x</sub>-emissions with 7-8 %. In the long run, with a dramatic increase of the proportion of daily household goods purchased via the Internet (here estimated at 25 % and 50 %), the case with a logistics centre produces the environmentally best effects. Should such a high proportion of on-line shopping of daily household goods become reality, a large restructuring of the branch can be predicted, which also will have a far-reaching impact on the logistics of daily household goods shopping and thereby its environmental impact.

**Survey.** A survey of attitudes among present and future residents was also conducted, aiming at finding out their interest in utilising the services of a logistic centre. The survey included 440 randomly chosen persons of whom 80 percent responded. The interviewees have been asked to answer questions regarding purchasing habits in general, on-line purchasing habits, use of computer

and Internet, and interest in services from a logistical centre. The results showed a surprisingly high Internet maturity among the residents and they are generally experienced with on-line purchasing. Approximately 70 percent were interested in utilising the services of the planned logistic centre. We assumed that it was realistic that, in the long run, about 50 percent would in fact utilise the centre. Saving time and not having to carry heavy bags were two of the main incentives stated for e-shopping everyday commodities.

**Local business.** In the year 2000 there were about 400 businesses in Hammarby Sjöstad. Some of these are likely to move away from the area due to high costs and be replaced by companies in the service sector. A survey of the transport behaviour of the local businesses was carried out in order to see if a demand for new logistics solutions existed. This study contains mapping of transport services likely to be demanded. The results show that the companies located in Hammarby Sjöstad primarily would be interested in co-ordinated transport for office equipment supplies and sanitary products. The survey also shows that schools and restaurants in the area would be interested in co-ordinated transport for services of food and beverages.

**Municipal institutions such as schools, daycare centres and elderly-care centres.** A survey of the potential for co-ordination of transports of groceries to schools, daycare centres and elderly-care centres was not carried out for Hammarby Sjöstad. Instead, background facts were taken from the results of a project carried out in Borlänge municipality. In the Borlänge-project procurement of groceries for municipal service units has been separated from procurement of transports. A central logistics centre has been created, collecting all deliveries and then the goods are being distributed to each service unit. The logistics centre is run by a private transport company.

The Borlänge-project has generated several positive effects:

- The number of stops for unloading have been reduced by 45 percent, reducing local emissions.
- The traffic safety has increased due to a reduced number of transports, planned routes based on customer demand and due to GPS-surveillance of the exact speed held.
- Market competition has increased, because the market has opened up for local farmers who don't have the capacity to deliver produce to all customers, but do have the capacity to deliver their production to one central logistics point.

**Competition.** In 2001 The City of Stockholm started a Technology Procurement of the logistical project, co-funded by government grants from The Local Investment Programme. In the beginning of 2002 the City of Stockholm launched the Local Logistical Centre Technology Procurement, aiming to find an environmentally oriented enterprise willing to operate the logistic Centre in Hammarby Sjöstad. The competition was won by Home Department AB in August 2002.

**Smart Logistics with HomeDepartment.se.** Home Department's business idea is based on a system where the district residents as well as, municipal service units and private companies operating in the area subscribe of logistical services. Through a monthly paid subscription to Home Department's services the customer gets delivery of purchased goods to their home or business door. The monthly subscription fee for residential customers is SEK 500 (approximately € 55). Business customers have individual agreements. The customers can place their orders on Home Department's home page [www.homedepartement.se](http://www.homedepartement.se), where 15 different shops are represented and with which Home Department has settled agreements. The supplier or shop pays a fee to Home Department for each separate delivery. For this fee Home Department collects the goods at the shop, and consolidate the goods with other goods to the area and to the specific customer with electrical lorries.

## **Financial resources and partners**

The project has cost 2,1 million SEK (aprox. 230 000 €) including pilot studies and surveys, coordination of the technology procurement competition, project management and prize money to the winning entry to the competition. The project was funded within the framework of a national programme for investments in sustainable development measures called The Local Investment Programme – LIP. The City of Stockholm and private companies contributes with about 90 percent and Swedish government with 10 percent. The logistics centre was one of 224 projects funded by the local investment programme in Stockholm.

## **Results**

The initiative has received positive media coverage both within Sweden and internationally, but at this stage the project have not lived up to the expectations. Today (November 2003) only one percent of all residents utilise the services offered by the Logistical Centre. This level corresponds to the average level of on-line shopping for the country as a whole. There are several reasons for the low level of utilisation: the cost of living in this particular area is relatively high; there is currently an economical recession in Sweden and several of the stores that used to provide on-line shopping are no longer providing services on the Internet – today there is only one provider of on-line shopping of groceries and everyday commodities in the Stockholm area.

In the Old Town in Stockholm, an area not very far from Hammarby Sjöstad, local business have shown interest in co-ordinated transports. So far, ten shops in the Old Town use the services provided by the Logistical Centre, and there are several additional potential users in the area.

The participation of the municipal facilities like schools, elderly care centres etc has not yet been possible but it is expected to happen in the near future. At the time of the launching of the centre the private contractors carrying out the municipal services were already bound by procurement agreements made with suppliers of food and office supplies

## **Lessons learned and repeatability**

Implementing new concepts takes time. From a community perspective, endurance pays off in the long run. It would therefore be an advantage if the procurement procedures would be organised in a manner that ensures the use of logistical services. The process would also benefit from political decisions taken in support of co-ordinated deliveries. In order to reach the full potential shown in the environmental simulation , the business must be extended geographically. Such a process has been initiated by the City of Stockholm. The reasons for increased involvement is the potential cost reduction for goods and transports, decreased environmental load from transport, and increased traffic security close to daycare centres and schools.

Advice from the Stockholm project to other municipalities include:

- Start the process with co-ordination of transports of goods to your own municipal service units and to private companies;
- Start off by offering a limited range of products in order to see how it turns out and then gradually extend the offer to new categories;
- A sufficient number of purchasers is vital – municipal service units, private companies or residents all form the base of potential customers;
- Efficient deliveries require a thought-through administrative system and co-ordinated routines that optimises the logistics;

- Private consumers are an important target group, but it takes long-term efforts in order to change the consumer habits. In Sweden, one percent of all everyday commodities are purchased through the Internet. This number is probably not representative presently for other countries since Sweden has Europe's highest degree of Internet-commerce but can give an idea of the future evolution. Calculations should of course be based on local conditions.
- Secure support from the political leadership and involvement from the municipal service units och private companies through personal contacts, training, information, marketing and media.

Contact for more information:

Project web site [www.stockholm.se/lip/](http://www.stockholm.se/lip/)  
Organisation/Agency: The City of Stockholm  
Main contact: Gregor Hackman  
Address: Näringslivskontoret, 105 35 Stockholm, Sweden  
Tel +46 8 508 29 000  
Fax +46 8508 29 780  
E-mail [gregor.hackman@snk.stockholm.se](mailto:gregor.hackman@snk.stockholm.se)

Contact: Agneta Persson  
Company ÅF Energiteknik AB, Stockholm  
Tel +46 8 657 10 00  
E-mail [agneta.persson@af.se](mailto:agneta.persson@af.se)

**References**

- "Smart infrastructure Solutions Implemented in Stockholm", Persson, A, ÅF-Energikonsult AB, Bratt M, Bratt Communication, Wahlgren P, HomeDepartment AB, Higson J, Higson Ltd
- "Future CO2 savings from on-line shopping, jeopardised by bad planning", Persson A, ÅF-Energikonsult AB, Bratt M, Bratt Communication
- Persson, A, and Trepte B, ÅF-Energikonsult "Logistics and on-line shopping of daily goods in Hammarby Sjöstad" ("Logistik och e-handel av dagligvaror i Hammarby Sjöstad", in Swedish only)
- Ericsson, U, "Handla dagligvaror över nätet. Utrednings- och statistikkontoret", in Swedish only