

# Smart infrastructure solutions implemented in Stockholm – systematic approach on transports pays off in many ways

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## Abstract

As a result of the work of the Council of Local Investment Programme, City of Stockholm, the first local logistical centre for coordinated transports has now been opened. During 2002 the City of Stockholm has run a competition for the operation of a logistical centre in the new city district Hammarby Sjöstad. The scope is to reduce energy consumption and CO<sub>2</sub>-emissions through coordinated transports for the district inhabitants, municipal organisations and private companies operating in the area. Surveys carried out show that a local logistical centre, which distributes various daily goods to end consumers with electric vehicles in a significant way levies the environmental burden of the transports. The largest identified transport work is distribution of groceries and other household goods. An assessment carried out shows that more than half of the inhabitants in the new city district show a positive attitude towards on-line shopping of their daily consumption goods. This alone could reduce transport energy consumption and CO<sub>2</sub>-emissions by almost 50%. Added value to this is e.g. enhanced traffic security close to schools and day care centres in the district, an increased level of service for the people living in the area, and better availability (and thus more market competition and conditions) for locally produced food.

The winning entry in the Stockholm competition on a local logistical centre includes e.g. delivery of on-line purchased daily goods, dry cleaning services, shoe repairs for

district inhabitants, and distribution of food and beverages to restaurants, schools, and day care centre for children and elderly in the area. The local logistical centre service levels and niches will be further developed in cooperation with the customers and several of the major chains of daily goods. These daily goods chains are very positive towards the possible development of on-line shopping that the local logistical centre will create. Hammarby Sjöstad will also be the centre for Sweden's first integrated distribution system for locally produced food. Inhabitants, schools, retirement homes, shops, and restaurants will be given the opportunity to buy fresh produce directly from approximately 300 local farmers. Information on the farmers' methods of production and types of food will be made available via Internet or a catalogue, to give consumers a unique insight to the origins of their food. In addition to being able to purchase their favourite local specialities, consumers will also be able to invest in farmers' future harvests, or book days out at their favourite farm for either recreation or a day's work at a farm. The first local logistical centre was opened in Hammarby Sjöstad, Stockholm, in December 2002.

## Logistics in Hammarby Sjöstad from the City of Stockholm's Perspective

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 inhabitants. 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) in terms of environmental impact.

The Local Investment Programme (LIP) is a four-year national programme. The Stockholm office has been run between 1998 and 2002, with 635 MSEK (approximately 70 million Euro) in national grants for sustainable development measures. The Stockholm LIP-Council has worked with technology procurement, aggregated purchasing power, development and demonstration projects and developed a model for environmental impact<sup>1</sup>. Approximately 300 projects have been carried out by the Stockholm LIP-council, among them the Local Logistical Centre aiming at sustainable environmental solutions through efficient and co-ordinated transports in Hammarby Sjöstad.

#### THE LOCAL LOGISTICAL CENTRE PROJECT

The Local Logistical Centre Project started in the year 2000, with the goal to reduce environmental impact through co-ordinated transports<sup>2</sup>. The project was aiming at inhabitants, homes and care for elderly, schools, restaurants and other businesses in the new city district Hammarby Sjöstad. Establishing a Local Logistical Centre was judged to be a possible sustainable solution. A number of surveys have been carried out during the project to verify the working hypothesis of less environmental impact with the chosen form of co-ordinated transports, and in 2001 a Purchasers Group was established for the Technology Procurement of the logistical project planned and arranged by the LIP-Council. Members of the Purchasers Group were representatives from building contractors, Internet based daily goods suppliers, schools, elderly care organisations and the City of Stockholm's Real Estate, Streets, and Traffic Administration. Jointly the Purchasers Group and the LIP-Council developed the working hypothesis to the final project goal of co-ordinated transports of daily goods for city district inhabitants, schools and restaurants and to include co-operation with local farmers.

A Requirement Specification was formulated from the Purchasers Group's requirements and the results from the surveys carried out during the project. In the beginning of 2002 the LIP-Council launched the Local Logistical Centre Technology Procurement, aiming to find an environmentally oriented enterprise willing to operate the Hammarby Sjöstad Local Logistical Centre. The competition was won by Home Department AB in August 2002. The Prize Award ceremony was lead by the Vice Mayor and Head of the Social Welfare Division of Stockholm, Mrs Margareta Olofsson, who expressed deep satisfaction in seeing this plan of a sustainable transport centre brought to reality.

#### PROJECT SURVEYS

Four major surveys have been carried out during the project. The first survey was a simulation of environmental impact of transport of purchased daily goods for the inhabitants of Hammarby Sjöstad<sup>3</sup>. The calculations show environmental impact (seven different parameters, among them CO<sub>2</sub> emission) due to transport of purchased daily goods between the shop and the customers' residences, and various levels from

0 to 50 percent on-line shopping of daily goods are assumed. The survey shows that the CO<sub>2</sub> emissions would decrease by 7 to 8 percent, should the on-line shopping of daily goods increase from 1 to 10 percent. Should the share of daily goods purchased on-line be of such an extraordinary proportion as half of all daily goods purchased, the calculations show that the CO<sub>2</sub> emissions would decrease with approximately 50 percent. Significant reduction of CO<sub>2</sub> emissions would also be possible to achieve between producers and daily goods suppliers should the suppliers change their distribution lines towards more special on-line shops.

The second project survey was an assessment of attitudes towards on-line shopping among inhabitants and inhabitants to be in Hammarby Sjöstad<sup>4</sup>. The survey shows attitudes towards on-line shopping based on interviews with 440 randomly chosen inhabitants (or inhabitants to be) in the area. 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 local logistical centre providing co-ordinated distribution of goods purchased on-line. The survey shows a surprisingly high Internet maturity among the Sjöstad inhabitants. The interviewees are generally experienced with on-line purchasing, and 70 percent of the interviewees claim to be prepared to take advantage of the services provided by a local logistical centre. Willingness to pay for the logistical services is high among half of the interviewees. The most common reasons claimed for on-line purchasing of daily goods are saving time and avoiding heavy or bulky carrying.

The third survey carried out within the LIP-Council's logistical project deals with interest of co-ordinated logistical services from enterprises already established in Hammarby Sjöstad<sup>5</sup>. This study contains an inventory of transport services likely to be demanded. The results from this survey show that the companies located in Hammarby Sjöstad primarily would be interested in co-ordinated transport of office equipment supplies and minor technical supply. The survey also shows that schools and restaurants in the area would be interested in co-ordinated transport services of food and beverages.

Finally, a fourth survey on flow of material and information, trade flows and an economical business plan for a virtual local logistical centre<sup>6</sup> has been carried out within this project. This study concludes among other findings that the local logistical centre needs to work with a high degree of efficiency, the best business opportunities for a local logistical centre contain a high degree of consolidation of many small deliveries from several distributors, and that a local logistical centre of this kind has good business opportunities.

#### Smart Logistics with HomeDepartment.se

The winning entry of the LIP-Council's Technology Procurement of local logistical services was delivered by Home Department AB. Home Department AB provides with a high level of service since December 2002 an added value to both residential and business customers in Hammarby Sjöstad. Home Department AB is supplying these services with a low environmental impact and efficient logistical solutions.

### BUSINESS IDEA

Home Department's business idea is based on a system where residential, business and organisational customers in the area subscribe to transport or logistical services. Through a monthly paid subscription fee 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 60 Euro), business customers have individual agreements on subscription.

Deliveries take place at fixed time windows. Residential customers can choose between two time windows, either between 5 and 7 pm or between 7 and 9 pm weekdays. Business customers and other organisations can choose time for deliveries either between 8 to 10 am, or between 11 am and 4 pm.

The customers can place their orders on Home Department's home page, where a number of important and influential suppliers and shops providing on-line purchasing 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 consolidates the goods with other goods to the area and to the specific customer. As an alternative the shop is given the possibility to deliver the goods to a co-ordination centre in Årsta four kilometres from Hammarby Sjöstad.

### LOGISTICS AND FLOW OF GOODS

The customers purchase goods on-line from optional suppliers and shops connected to Home Department. For the time being there are approximately 20 different shops at the virtual galleria at [www.homedepartment.se](http://www.homedepartment.se).

The customers' orders are picked up at the shops and suppliers by Home Department with light lorries, environmental class 1 (least environmental impact), and delivered to a co-ordination terminal in Årsta, in the outskirts of Stockholm. Here the purchased goods are consolidated to one delivery per customer. Then twice a day transport of goods is continued to Home Department's local logistical service centre in Hammarby Sjöstad. Finally the goods are distributed in the area with light electrical lorries from the service centre to the residential customers' doors or the business customers' places at agreed time.

### SUPPLIED SERVICES AND GOODS

The customers can or will shortly be able to purchase the following kind of goods and services through Home Department's home page [www.homedepartment.se](http://www.homedepartment.se):

- Daily goods from two major suppliers
- Dry cleaning
- Shoe repair services
- Film and music
- Cameras, film and photo supplies and services
- Kitchen equipment
- Office equipment and supplies
- Clothes from two major supply chains

- Books
- Package services and stamps from the Swedish Post Office
- Various home equipment and tools
- Ecologically produced fresh food directly from local farmers ("The Farmers Own Market", Bondens egen Marknad BeM)
- Pharmaceuticals
- Wine and other alcoholic beverages
- Take away food

Shops or suppliers from various branches may add to or disappear from the list due to the customers' choice and wishes. Home Department is actively working for a sustainable development with low environmental impact.

### HOME DEPARTMENT'S GOAL

The long-term goal (2012) for Home Department's Local Logistical Centre in Hammarby Sjöstad is to supply service to 25 percent of the households (corresponding to approximately 2 000 units) and a significant share of the business companies and other organisations in the area. The short-term goal is to reach subscription agreements with 500 customers during the first two running years.

### ENVIRONMENTAL IMPACT

All deliveries made by Home Department will be carried out with the least possible use of non-renewable resources. Calculations show that Home Department's logistical services replace 10 diesel-supplied lorries with one electrically driven lorry serving the area daily. In addition to this the use of private cars for daily goods purchasing will decrease.

### The farmers own market/Fresh food directly from the farmer – Integrated Local Food Distribution Project

The production and distribution of food is becoming increasingly industrialised and centralised. Food products are shipped vast distances through a chain of distributors, processors, packagers, and retailers before they finally reach the consumer. Each unnecessary food mile adds an extra strain on our already taxed environment. The length of the distribution chain deprives the consumer of fresh products; indeed many products are picked before they are ripe which affects the nutritional value and the taste. Although the food industry churns out an ever-increasing number of products, in reality we are witnessing a massive decline in the variety of fruits, vegetables, and animal types. The move towards large-scale industrial food production is detrimental to the interests of many small farmers, a large number of which are driven into bankruptcy every year. The losses in terms of traditional countryside landscapes and specialised farming skills are irreplaceable. The speed and scope of this change has an ever-increasing affect on producers, consumers and our environment. A way of manifesting a counter balance would be to create a project that promotes the production,

distribution, marketing and retailing of food in an area local to its production.

### INTEGRATED LOCAL FOOD PROJECTS

The major problem in promoting the sale of food in the area local to its production is the lack of a functioning distribution network dedicated to local actors needs. Today distribution is generally geared towards large-scale centralised solutions. Although there is a demand from many consumers, institutions and retail outlets for locally produced food, the majority cannot access it. Starting a successful distribution system depends on creating a maximum volume to a minimum of delivery points. Having a variety of different types of delivery points would best facilitate initiating the development of a local food distribution network. If these retail points were then integrated so that they cooperated in distribution, and marketing, we could create a stable, dynamic distribution system, with flexible expansion possibilities. The type of retail/distribution points envisaged are direct box deliveries to consumers, CSA's, restaurants, schools, retirement homes, specialist shops, and supermarkets. There are many successful local food projects in each of these categories around the world, by documenting and learning from these projects, an integrated approach could be created whereby these projects could be coordinated to support one another. Such an integrated approach would provide a more powerful catalyst in developing local food systems, than current day uncoordinated piecemeal activities.

### THE STOCKHOLM BEM PROJECT

The forerunner to the current project is the award winning "Bondens egen Marknad" (farmers market) where food producers come into town once a week under a 14 weeks period to sell their fresh produce directly to the consumer. Two of the major problems for small food producers have been the difficulty to find food outlets willing or able to take their produce, and the difficulty in communicating the name and value of their products to the consumer. In essence they have lacked direct access to the consumer. BeM has solved these problems by providing a distribution point that the farmers control themselves, and putting them in direct contact with the consumer. Similarly there has been a consumer demand for locally produced products, and a desire from consumers to know how their food is produced, that has not been fulfilled by today's food industry. BeM has solved the consumer's dilemma by providing direct access to local food and an opportunity to meet the producer. The dynamic success of the project has been due to the catalyst created by putting these two groups together, and thus solving their respective dilemmas.

Although BeM has provided a valuable opportunity for a large number of producers, and satisfied the needs of many consumers, it is essentially a job half done. There are many producers who have equally attractive products, yet do not feel that selling to consumers at a market is the best solution for them. Also there are many farmers who already sell at farmers markets who would like to sell to the consumer both before and after the market season. Similarly there are many consumers who cannot attend the markets that are in use, or who already buy at markets, but lack access to this produce

both before and after the market season. For these consumers and producers there is the need to create an alternative strategy.

### INTEGRATING BEM SERVICES WITH THE LOCAL LOGISTICAL CENTRE

Using funding from the Swedish Dept of Agriculture, a study has been made of successful local food projects involved in supply to different types of distribution outlets in Europe and the USA. Using this information as a base, an integrated approach for organising the distribution of locally produced food has been created. The base for the distribution system will be a direct box delivery of farm products to 5000 consumers in the Hammarby Sjöstad city district. Using this volume as a base deliveries will also be made to a limited selection of local restaurants, schools, retirement homes, specialist shops, and supermarkets. These activities will also be linked to the successful ongoing "farmers market" in the area. In this way we can maximise volume deliveries in a limited area. Whilst maximising delivery volume in a limited area provides a catalyst for a successful distribution system, allowing the consumer to meet the producer provides a powerful catalyst in market communication. Every distribution point whether it is a school restaurant or shop will be supplied with information on the farmers delivering the produce. This information will be provided in CD form so that restaurants can for example include pictures and information regarding the origin of their produce in their menu's, supermarkets on their shelves etc. A more detailed version of this information will also appear on a website dedicated to informing the consumer who produces their food, the range of products that are available, and how they are produced.

### Summary

Smart infrastructure solutions with a systematic approach on transports pay off in many ways. The City of Stockholm has through its LIP-Council undertaken a successful Technology Procurement of a Local Logistical Centre resulting in High Quality Services with Low Environmental Impact. Should lower environmental impact (through decreased demand of transport work) and higher quality service not be enough, there are a number of added values to this in the Stockholm project. These values are e.g. enhanced traffic security close to schools and day care centres in the district, an increased level of service for the people living in the area, and better availability (and thus more market competition and conditions) for locally produced food. The City of Stockholm is aiming at providing long-term conditions for establishment of local logistical centres in other city districts too. A second local logistical centre is planned to be opened in the city district Old Town in June 2003.

The Technology Procurement of a Local logistical Centre in the new city district Hammarby Sjöstad was thoroughly based on several studies and surveys. The project was jointly carried out by the City of Stockholm, through their LIP-Council, and a Purchasers Group. The Purchasers Group was constituted by representatives from building contractors, Internet-based daily goods suppliers, schools, elderly

care organisations and the City of Stockholm's Real Estate, Streets, and Traffic Administration.

The winning entry of the LIP-Council's Technology Procurement of local logistical services was delivered by Home Department AB. Home Department AB is now since December 2002 with a high level of service providing an added value to both residential and business customers in Hammarby Sjöstad. The customers purchase goods on-line from optional suppliers and shops connected to Home Department, and Home Department AB delivers the purchased goods with least possible environmental impact. One very interesting option for the residents and businesses in Hammarby Sjöstad integrated in this system is to buy locally produced fresh food. This integrated approach for organising the distribution of the locally produced food has been created through the project "The Farmers Own Market" (Bondens egen Marknad, BeM).

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