

**NTNU - Innovation in Urban Freight International Workshop  
September 15-16, 2014, Oslo, Norway**

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**Municipal co-distribution - to meet environmental demands and bring a shift in power of the supply chain**

Sweden with a large public sector reflects in many ways organization and functions in private enterprise, where the business model for sourcing and distribution of goods to schools and elderly care is one such area. Logistics in local government is dependent on (personnel) resources at hand, but where logistical knowledge generally is low, compared to for example the field of information technology. Benefits of use of logistics in-house are found in increased (transport) efficiency in supply chains of goods to municipal receiving entities, but can also reduce the environmental impact of transport flows for waste collection, school transport and scheduling in home care services.

Co-distribution has strong ties to traditional city logistics and the definition that govern R & D within the framework of "Institute for City Logistics". The City Logistics concept specifies the process as "optimizing logistics and transport activities by private companies in urban areas through the rationalization of its operations". In this regard, the municipality becomes a logistics provider for co-distribution of goods, which has to be distinguished from its role as traffic regulator and more traditional city logistics, such as; environmental zones and the development of freight partnerships, all of which are in themselves important questions towards a sustainable transport system.

The presentation highlights the development from goods distributed by "free delivery" to "co-distribution", from its inception as rudimentary business model with procurement of a freight consolidation centers (FCC), vehicles and transport planning, to integrate e-commerce into the supply chain, and finally when the municipality itself takes over logistics and planning from the transport sector.

Co-distribution under municipal management in Sweden is nothing new, the concept has expanded in three stages with progressively more responsibility in municipal procurement of goods based on the Swedish Public Procurement Act (LOU). The organizational innovation was first implemented in 1999 as a cluster partnership with four municipalities, the "Borlänge model". The innovation implies that the municipality abandons the previous business model with free delivery where the supplier of goods procures and provides transportation. Instead will the procurement process of goods, be separated from the physical distribution where the municipality becomes the principal of transporter/freight forwarder responsible for the FCC, vehicles and logistics planning.

It took ten years for the idea to spread and a second level of development took place in 2010 when the municipality of Växjö integrated e-commerce with co-distribution in parallel procurements. The combination gives the municipality the opportunity under the Public Procurement Act, to increase competition among bidders. The method involves incorporating short procurement periods and segmenting the tender where suppliers may bid on a particular item, or flexibility to group items into a bid of own potential, for a certain period during the year, or for a specific geographical area.

To disaggregate a procurement document is practically impossible without e-commerce and co-distribution, which ensures that small and medium enterprises (SMEs) participate in tenders. That SMEs participate constitutes hidden demands from policy makers and citizens in Sweden, demands that without co-distribution would not meet the requirements of the Public Procurement Act. The demand for distribution in the business model of "free delivery", is the main barrier for SMEs and local producers to participate in a municipal procurement process.

In a third level of refinement of the Borlänge model, will the municipality as freight owner not only control their own supply chain, but also take control of logistics and information flow with demands of digital information in all stages between all stakeholders. With logistics "in-house", the "Ystad-Österlen model" was developed with procurement based on route optimization and performed by its own staff, and provided ready-driving routes with sequence of deliveries (stops), vehicle kilometers of travel (VKT) and time worked. It is then up to bidders to consider bid-level when procuring terminal (FCC) and vehicles, with tender as price indicator of kilometers and working hours, instead of a fixed price per delivery. Reverse billing in the second stage makes up the payment to the transporter, the municipality indicates in kilometers and time worked what will be invoiced, hence the term "reverse billing".

The first implementation that was conducted with a resource-optimized procurement model (Ystad-Österlen model), showed a reduction in deliveries by 75 percent for the municipal cluster, from 26.245 per year at free delivery to approximately 7,000 per year with co-distribution, with corresponding reduction in environmental impact (VKT) and number of heavy vehicles on the roads. This is a new direction from what has been prevalent in Swedish R & D over the past two decades, where the fundamental criteria has been that change in behavior will take place on a voluntary basis and through competitively neutral business collaboration in various sectors. With regard to the development of a new business model and hence, the ties to the theme of innovation in urban freight and in particular to innovations in distribution, have a resource-optimized procurement model based on route optimization generic applicability in the private sector.

Inferring behavior change to reduce environmental impact and increase operational efficiency means that local authorities will not only take control of their own supply chain, but also control over the logistics and the information flow with requirements for transparency and digital information at every stage. The emerging shift in power implies a significant impact on the organization and changing roles of stakeholders. The transport industry and their previous superiority of power over the entire supply chain, will be shared with the transport buyer's demand on transparency and monitoring of work performed. Ultimately what happens, is a shift in power from transporter to transport buyer, an area that needs to be explored with further R&D.

Key sources;

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