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## **GOOD PRACTICES TRANSFER IN LOGISTIC AS A TOOL OF STREAMLINING CITY LOGISTICS**

### **Abstract:**

Distribution of goods in the urban areas facing the problem of increasing congestion is a serious difficulty for the local authorities. This paper presents possible sources of best practices in city logistics for local governments, i.e. European projects, such as SUGAR<sup>1</sup>.

Key words: knowledge transfer, city logistics, SUGAR project

### **INTRODUCTION**

OECD<sup>2</sup> experts in their work ‘Knowledge Management in the Learning Society’ state that knowledge plays a pivotal role in economic development but it is difficult to gain and measure and remains unverified in many branches. Therefore, there are many definitions and interpretations of ‘knowledge’. From the economic point of view data, information and knowledge are a separate kind of economic goods and their usefulness is defined [8]. Knowledge is a collection of statements which describe the world we live in. Certainly the world is changed by new information. Information is a regularity that can be noticed in data describing space, time and energy and gaining it involves economic costs [8]. In this way we can see the process of transformation: data are changed into information and then into knowledge.

### **1. WHAT DOES IT MEAN KNOWLEDGE AND KNOWLEDGE TRANSFER?**

Undoubtedly, knowledge is becoming the basic source of an enterprise. That is why, the issue of knowledge transfer is extremely important nowadays as this knowledge is difficult to transfer. The term ‘knowledge transfer’ is not precisely defined. Knowledge transfer refers to

<sup>1</sup> Sustainable Urban Goods logistics Achieved by Regional and local policies ([www.sugarlogistics.eu](http://www.sugarlogistics.eu))

<sup>2</sup> OECD (Organization for Economic Cooperation and Development)

transmitting ordered and interpreted pieces of information, not necessarily technical information but it can be e.g. knowledge concerning logistics or marketing.

When trying to analyze the issue of knowledge transfer we should name four elementary sorts of knowledge which go back to ancient times [5]:

- Know-what.
- Know-why.
- Know-how.
- Know-who.

Know-what knowledge shows factual knowledge and refers to definitions of terms. Know-why knowledge is knowledge about rules and laws of nature, human mind and society. This type of knowledge is crucial in some fields of science such as chemical or electronic industry. Access to this kind of knowledge speeds up technological development and prevents making mistakes in the stage of experiments. Know-how knowledge is unique for every organization. This sort of knowledge is usually one enterprise's or one research team's domain. However, cooperation between individual organizations results in networks of connections which allow transfer of fragmentary know-how knowledge. Know-who knowledge indicates the knowledge owner, people or institutions that know exactly what to do. This type of knowledge is fundamental for creating specific structures which provide access to experts who can help to solve problems in the changing world.

At this point the issues of public and private knowledge should be dealt with. Undoubtedly, knowledge is a very unique commodity because it is partly public and partly private. Know-how knowledge is a type of knowledge with very limited public access and its transfer is very complex because this knowledge reflects personality of a given organization. Know-how knowledge will never become a public commodity and it can become available to enterprises only by employing experts or by strategic alliances with other companies. An example of public knowledge is know-who knowledge because almost everyone has the access to the Internet and can find information about experts and companies there. This knowledge is available to everybody. However, some knowledge is neither only public nor only private because know-what knowledge may be unavailable to those who do not have perfect IT technology or connections with social networks.

You should pay attention to the fact that hidden knowledge is very difficult to transfer. The more hidden this knowledge is, the less available to enterprises or public sectors it is. The way of transferring knowledge depends on the nature of knowledge transferred.

There are five types of knowledge transfer [4]:

- Serial transfer.
- Near transfer.
- Far transfer.
- Strategic transfer.
- Expert transfer.

Serial transfer applies to a team that does the same tasks. In serial transfer the source team and the receiving team are one and the same. This transfer prevents repeating expensive mistakes and increases the efficiency of tasks.

In near transfer the source team is different from the receiving team. The main difference is location of both teams performing a specific task. Near transfer offers transferring explicit knowledge from location to location. It is widely used in transferring best practices.

Far transfer deals with transferring tacit knowledge. The source team and the receiving team perform unrepeatable tasks. Knowledge is transferred by interpersonal relations on the request of the receiving team. Far transfer provides transferring very specialized knowledge and brings about significant effects.

Strategic transfer applies to difficult complex situations. This type of transfer impacts large parts of the system, sometimes even the whole system, and differs from far transfer which impacts only one team or unit.

The last type is Expert Transfer. It refers to very complex problems which are beyond the scope of knowledge of the team dealing with them. Knowledge of an expert who prepares opinions is needed.

The kind of transfer depends on the knowledge transferred. It is of great significance to choose the best way of knowledge transfer as influences the effectiveness.

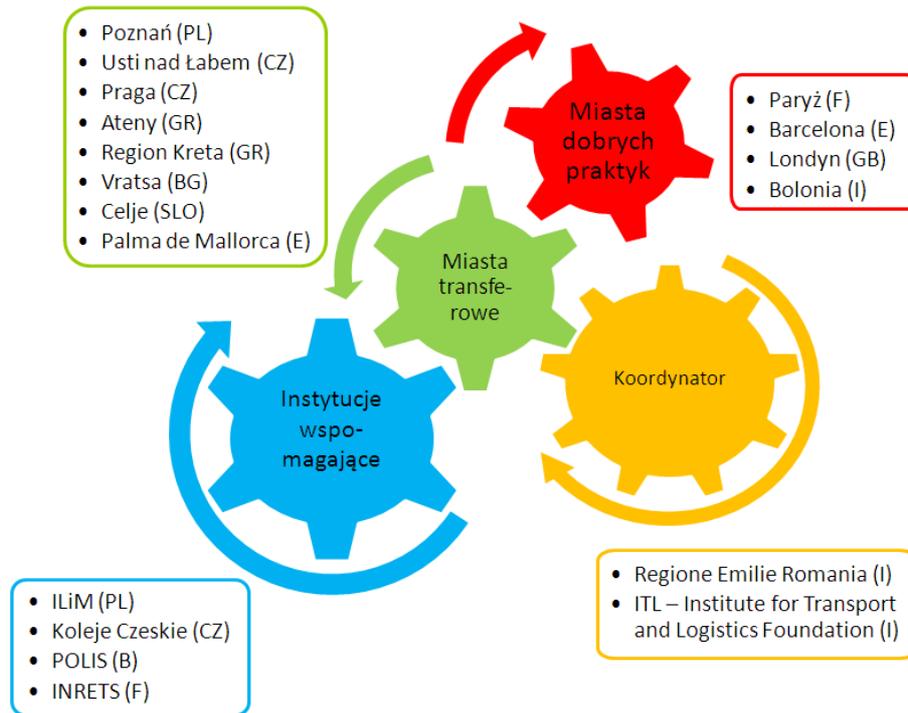
The following chapters of this publication discuss best practices concerning city logistics and examples of knowledge transfer to regions, results from experience gathered by the authors from SUGAR project.

## 2. SUGAR PROJECT

Example of project which illustrates knowledge transfer in modern logistic solutions between chosen cities is SUGAR (Sustainable Urban Goods Logistics Achieved by Regional and local policies). Sugar project was successfully integrated into the INTERREG IVC Programme in 2009 year and will be run until the end of February of 2012 year.

The main objective of the project is to analyze the causes of inefficient and ineffective management that still affects on the urban goods distribution in most European cities. SUGAR project promotes the exchange, discussion and transfer of experiences and good practices between Good Practice Site (Bologna – Italy, London – Great Britain, Paris – France and Barcelona – Spain) and the Transfer Site (Palma de Mallorca – Spain, Crete – Greece, Athens – Greece, Poznan – Poland, Vratsa – Bulgaria, Celje – Slovenia, Usti upon Labe – the Czech Republic, Prague – the Czech Republic) through updating policies and planning development in the management of urban freight. Therefore, identification of good practices play a key role in supporting of regional policies development.

Exchange of good practices works as a lever which stimulates the development of local action plans in urban logistics.



Drawing 1. SUGAR Project consortium.

The purpose of knowledge transfer between the stakeholders of the project is solution the problem of inefficient and ineffective management of urban goods transport, which is a very important element of urban transport system, as well as a significant source of pollution emissions.

The SUGAR activities are divided in 3 main pillars:

- Collection, analysis of the best practices and identification their key performance indicators.
- Knowledge transfer takes place during:
  - Good Practice Round Table.
  - The Trainers Sessions.
  - Joint Planning Exercise which are dedicated to transfer sites.
  - Site Visit where are presented some examples of logistical problems solutions.
- Developing plans (vision and strategy) for urban logistics activities for all sites involved in the project.

### 3. SELECTED BEST PRACTICES IN CITY LOGISTICS

The following chapters of this publication discuss chosen examples of successful solutions used in city logistics. These solutions could provide a possible source for knowledge transfer. Identified best practices are the result of work carried out under the SUGAR project – Deliverable D3.3 – Good Practices Analysis.

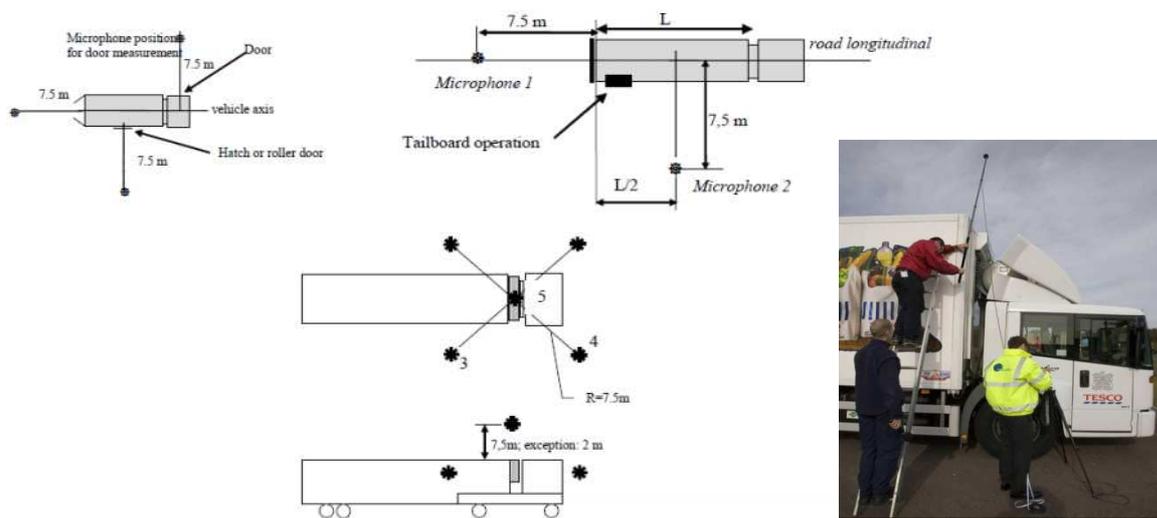
#### 3.1 Night deliveries – noise emission standards

Objective of the night time delivery policy is to allow more silent trucks to operate in city centre area in late hours in order to avoid congestion, while respecting the noise legislation.

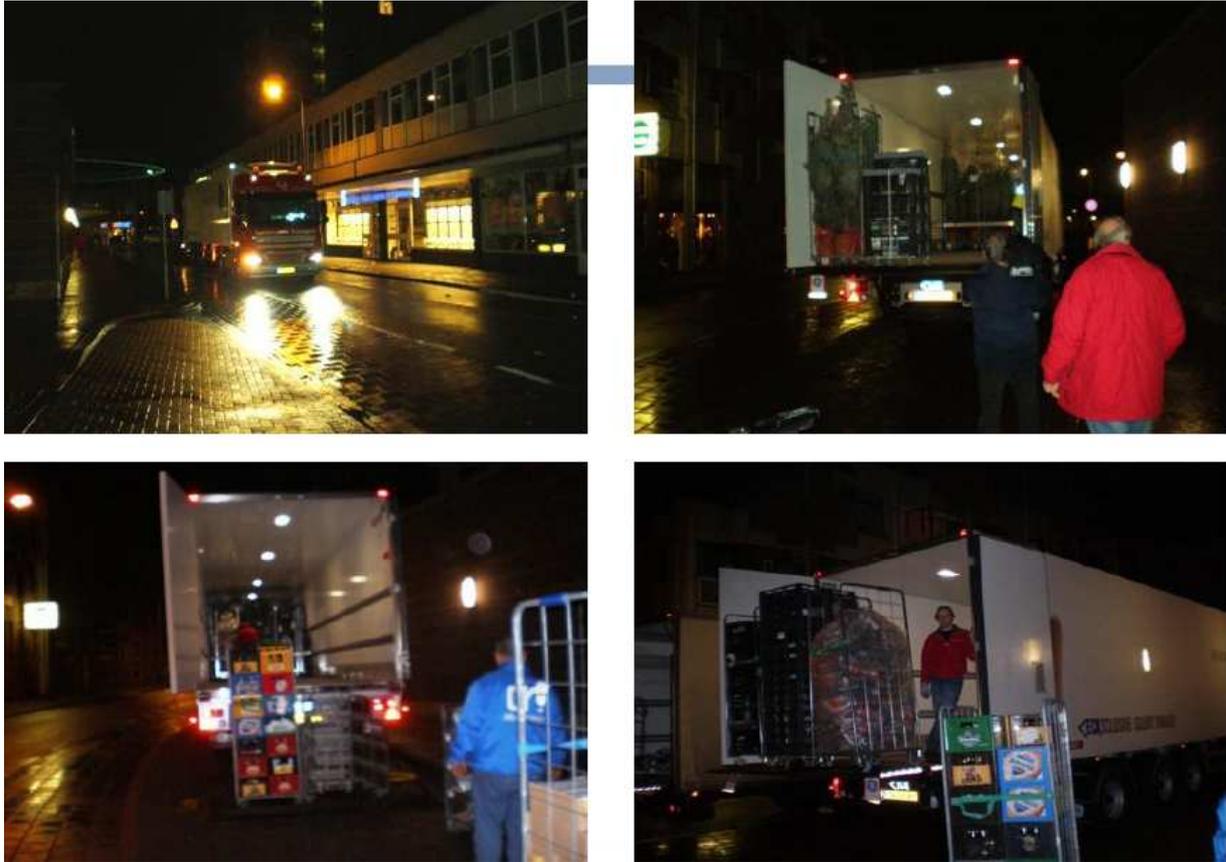
Special trucks, special equipment and corresponding driver behavior are the conditions required.

In 1998 the Dutch Government set out standards for noise emission during loading and unloading in retail trade and craft businesses. This resulted in a project called PIEK and in 2004 in the PIEK certification scheme for vehicles and equipment operating under 60dB(A) which will be suitable for use in night time deliveries without causing noise disturbance. To achieve the standard, each product is acoustically measured and must function emitting under 60dB(A) at 7.5 meters from the sound source. It is then deemed suitable for out-of-hours delivery that will not cause noise disturbance to nearby residents.

In 2007 the Albert Heijn retail chain has started 10 pilot projects at the same time. The aim of project was realization of supply to selected supermarkets at night and early morning. During the three month period there was realized around 1000 supply by vehicles and equipment specially adapted and satisfies the requirements of the PIEK program.



Drawing 2. Noise emission analysis scheme.



Drawing 3. Example of realization of supply at night for supermarket.

The following table provides a comparison of selected economic and environmental parameters obtained before and after implementation of the PIEK program on a particular route: Tilburg - Eindhoven.

Table 1. Comparison of economic and environmental parameters [1]

Parameters	Before PIEK program	After PIEK program
Tilburg – Eindhoven distance [km]	35	35
Average time [h]	1,5	0,5
Vehicle	Volvo FH400	Volvo FH400
Distance year [km]	210 000	210 000
Average fuel consumption [L]	43	33
Driver labor cost [Euro]	20 700	8 100
Fuel cost [Euro]	90 300	69 300
Total cost per truck [Euro]	111 000	77 400
CO <sub>2</sub> emission [t]	244	187
HC emission [kg]	4	4
NO <sub>x</sub> emission [kg]	633	486
PM10 emission [kg]	10	7

Analysis of above table shows that after the introduction of PIEK standard there was achieved significant economic savings (decrease total cost of transportation about 33 600 Euro) and reduction of environmental pollution about 30% (eg nitrogen oxides emissions and carbon dioxide).

### 3.2 Intermodal transport – Monoprix

Since 2007, Monoprix, a large French distribution group (a subsidiary of both Galeries Lafayette group and Casino), has reorganised its logistics supply chain from road to rail for the incoming products of its 62 supermarkets in Paris<sup>3</sup>.

The initial initiative came from the national Ministry of Transport and its regional branch (DREIF<sup>4</sup>). They looked for potential experiments for regional rail transport (short lines). Monoprix volunteered to test the project.

Before the trial, Monoprix delivered its 60 supermarkets in Paris by trucks from a terminal 35 km South of Paris.

In order to anticipate a more and more restrictive regulation for deliveries in urban areas, Monoprix decides to deliver some of its products (non-alcohol beverages and general products such as textile, home and leisure articles, perfumes) by train.

The goods are moved to a rail terminal located within Paris (Bercy station in the East) and the final deliveries to the supermarkets are made by CNG trucks.

Today, a weekday train with 20 wagons arrives late in the evening to Paris. In the next morning CNG trucks deliver 60 supermarkets in Paris. The rail-road intermodal depot is used only for transshipment, with no other logistics activities.

Technically, it was necessary:

- To move 210,000 pallets/year equivalent to 20 wagons/day.
- To find a slot on the railway line (RER D) without hurting passenger traffic.
- To do works to connect the 2 terminals to the railway networks (rail sidings).
- To soundproof the terminal in Paris, to make it HQE (Environment High quality).

Financial constraints for the operator: purchase of CNG vehicles, purchase of CNG from a single gas station operator on the site, due to a lack of available CNG stations in the area.

Decision making constraints: the reorganisation of logistics operations was only possible for a restricted amount of delivery products, not for fresh food, therefore the standard trucks deliveries is still running in parallel to the CNG deliveries.

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<sup>3</sup> First delivery of foods by train was executed at 28/11/2007.

<sup>4</sup> Direction régionale de l'Équipement d'Ile-de-France



Drawing 4. Intermodal depot Bercy in Paris.

15 months after the beginning, the energy savings are less important than expected but remain significant.

Table 2. Environment parameters reduction level [1]

Parameters	Reduction level [%]
CO <sub>2</sub> (carbon dioxide)	25
CO (carbon monoxide)	7
NOx (nitrogen oxide)	50
Particulates	16

### 3.3 Multifunctional lanes

To reduce the effects of increasing traffic in the commercial center of Barcelona, the municipality has implemented new street use management. Five multifunctional lanes exist today in Barcelona with VMS<sup>5</sup> technology. Lanes are used from 8 to 10 a.m. for general or bus traffic, from 10 a.m. to 5 p.m. for deliveries, from 5 to 9 p.m. for general or bus traffic, and finally from 9 p.m. to 8 a.m. for residential car park.

Through a better regulation of traffic and parking on major boulevards, the objectives of this measure are to:

- Reduce illegal parking.
- Reduce double parking.
- Reduce travel times and the search for parking space.
- Optimize the use of the street space.

<sup>5</sup> Variable Message Signs

Variable message signs (VMS) display the access rights per user group in real time. A first VMS shows if the lane is dedicated to general traffic or parking or loading activities. In case the lane is dedicated to parking or loading activities, a second VMS shows the actual allowance for a particular user group. Second VMS shows actual capacity of parking or loading places.

The multi-use lanes are successful to optimise the use of the street space and improve traffic. The main result has been a reduction of between 12-15% in travel time. The needed infrastructure constituted an additional cost of 0.5 million Euros per boulevard (VMS technology included).

Drawing below show examples of Variable Message Signs.



Drawing 5. Variable Message Signs in Barcelona.

## CONCLUSIONS

In case of the SUGAR project we deal with near transfer since explicit knowledge is transferred from location to location. In the discussed project knowledge is transferred from good practice site to transfer site. SUGAR project, for most transfer sites, is first attempt to transfer knowledge in the field of city logistics. Each transfer site has appointed a variety of purposes, such as, limiting access to the center for the heaviest vehicles, establishment of public – private partnerships in the field of infrastructure investment and finally to improve the supply in heavily urbanized areas. An example of proper utilization of the results of the SUGAR project is the city of Poznan. On the basis of experience and accumulated knowledge, Poznan plans developing the fifth, missing city's transport policy in the field of urban logistics<sup>6</sup>. There are many ideas and initiatives, but the primary factor in the effective transfer of good practices is consequence in the implementation and ongoing consultations with stakeholders (e.g. entrepreneurs, logistics operators and inhabitants).

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<sup>6</sup> So far, four programs have been developed which elaborated transport policy of Poznan city: public transport, parking policies, cycling program and road program.

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### **TRANSFER DOBRZYCH PRAKTYK LOGISTYCZNYCH JAKO NARZĘDZIE USPRAWNIANIA LOGISTYKI MIEJSKIE**

#### **Streszczenie:**

Miejska dystrybucja towarów w czasach gwałtownie wzrastającej kongestii ruchu na ograniczonym obszarze dużych aglomeracji stanowi olbrzymi problem dla władz lokalnych. Niniejszy referat przedstawia możliwe źródła pozyskania dobrych praktyk w zakresie logistyki miejskiej dla władz lokalnych, jakimi są m.in. projekty europejskie, np. projekt SUGAR

Słowa kluczowe: transfer wiedzy, logistyka miejska, projekt SUGAR



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