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Urban Consolidation Centers, urban freight transport

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URBAN FREIGHT CONSOLIDATION CONCEPTS: IS THERE SOMETHING MISSING?

Summary. Today, many cities in the world struggle with an increasing demand arising from quick population changes. Most European big cities experience congestions, pollutions, saturations, uncollected waste, public dissatisfaction, and unpleasant environment to work and live in. In order to respond properly and effectively to these phenomena, city authorities are forced to take speedy and right decisions of ensuring good living conditions for all the residents. Reorganizing, rebuilding and enlarging cities is a difficult task which in many cases is on the boundary of impossible because of historical reasons, heritage and preservation of environment. Urban Consolidation, however, might be a good solution. In this paper we introduce urban and urban freight consolidation concepts, where our aim is to identify and reveal missing knowledge to the current state of the art.

ПОНЯТИЯ ГОРОДСКОЙ ГРУЗОВОЙ КОНСОЛИДАЦИИ: ЧЕГО ТУТ НЕ ХВАТАЕТ?

Аннотация. В настоящее время многие города в мире борются с возрастающими потребностями, являющимся результатом быстрых популяционных изменений. Большинство европейских больших городов испытывают скопления, загрязнения, насыщенность, неполученные долги, общественную неудовлетворенность, неблагоприятную окружающую среду в которых приходится работать и жить. Чтобы должным образом и эффективно соответствовать этим явлениям, городские власти вынуждены принимать быстрые и правильные решения для обеспечения хороших условий жизни для всех жителей. Реорганизация, восстановление и увеличение города является трудной задачей, которая во многих случаях находится на границе возможности вследствие исторических причин, наследия и требований сохранения окружающей среды. Городская Консолидация, тем не менее, могла бы быть хорошим решением. В этой статье мы вводим понятия городской и городской грузовой консолидации, и наша цель состоит в том, чтобы идентифицировать и добавить недостающее знание к текущему состоянию гуманитарных наук.

1. URBAN CONSOLIDATION

Generally speaking, urban consolidation is seen as a means by which more people can be brought and live into existing residential areas within cities where the necessary infrastructure and resources such as public transport, schools, shops and other utilities already exist.
In the dictionaries the word *consolidation* is described as:

1. The act or process of consolidating.
2. The state of being consolidated.
3. The merger of two or more commercial interests or corporations.
4. Combining into a solid mass.
5. Something that has consolidated into a compact mass.
6. The act of combining into an integral whole; "a consolidation of two corporations".
7. The act of combining things to form a new whole.

Under the word *Urban*, the following is understood:

1. Of, relating to, or located in a city or town.
2. Characteristic of the city or city life.
3. Relating to or concerned with a city or densely populated area.

According to the foregoing definitions, when one speaks of urban consolidation, one should think of as Acts and/or Processes of combining infrastructure and resources, which are related to and concerned with cities and/or densely populated areas in order to form a new, a better integral whole.

According to Wikipedia, the free encyclopedia (http://en.wikipedia.org/wiki/Urban_consolidation, consulted on the 21st August 2009). Urban Consolidation refers to a diverse set of planning policies intended to make better use of existing urban infrastructure by encouraging development within existing urbanized areas (so-called Brownfield sites) rather than on non-urbanized land (aka Greenfield sites), thus limiting urban sprawl. Urban Consolidation involves increasing the number of houses or units within existing areas so they can have more efficient use of services and reduce the overall impact on the environment. Urban Consolidation is then thought of as a means to reduce the total amount of land needed to house the population.

According to other definitions:

1. Urban Consolidation is... a planning policy directed to bringing about the more efficient use of a finite resource namely existing or likely future urban land and involves increased density (Simpson 1989, p 50)

2. Urban Consolidation is the process of increasing and/or maintaining the density of housing in established residential areas in order to increase or maintain the population densities of those areas (Smith 1997, pp. 3)

To simplify and conclude, for the objectives of this discussion we assume that *Urban Consolidation* is a number of activities that aim to ensure living conditions for an increasing demand because of population increase and/or population change, within the existing cities, without further unnecessary expansion, which is extremely capital intensive and environmentally unfriendly.

Where people live there is a significant amount of daily freight flows. People consume every day, which is related to all the products and things that we need and want in our daily lives. Every day there is waste, which is referred to as rubbish, trash, and garbage as well as junk. Waste has negative effects on environment and society, and therefore a special additional care has to be given when cities and municipalities deal with this issue.

Within Urban Consolidation, a critical question is how the freight distribution and waste collection is fulfilled subject to the daily needs of the society and the environment. On the face of it, there is an imminent need of reliable, effective and environmentally-friendly urban freight consolidation systems for freight distribution and waste collection, and this is where we want to focus on.

2. URBAN FREIGHT CONSOLIDATION

It is worth noting that urban freight consolidation is not a new notion or concept. Instead it has been presented some 50 years ago. The following citation makes it clear: Cadotte and Robicheaux (1979) *"The distribution of freight in most urban areas is characterized by high concentrations of truck activity in central business districts (CBD's). In this context, the movement of freight from suppliers, to resellers to ultimate customers is typically performed by a very large number of small carriers who duplicate each other's paths with partially filled trucks while each is in the process of picking up and delivering a large number of very small shipments. In many communities, this distribution structure results in unnecessarily high levels of congestion, pollution and energy consumption, as well as high distribution costs which are passed on to consumers in higher product costs. Several decades ago, business organizations responded to these pressures and initiated shippers' associations and freight forwarder operations to achieve the economies of consolidated shipments. Since 1942, however, the growth in the number of freight forwarders has been drastically curtailed."*

Recently, definitions of the urban freight transportation subject have been provided for instance by (Stantchev and Whiteing, 2006): Urban freight transport and logistics operations are concerned with the activities of delivering and collecting goods in town and city centers. These activities are often referred to as 'city logistics' as they entail the processes of transportation, handling and storage of goods, the management of inventory, waste and returns as well as home delivery services. Often many of these processes, or parts of them, are undertaken outside urban areas but they still have impacts on urban operations. Therefore, freight transport and logistics operations in urban areas cannot be viewed and studied in isolation but rather in the context of the entirety of supply chains that typically cross the geographical boundaries of urban areas.

The growing significance of urban freight transport and logistics is related to increased population and sustained economic growth in urban areas. Goods transport in cities represents from 10 to 18% of road traffic (COST321, 1998). As the majority of the population in Europe lives in urban areas and the bulk of industrial production is dispatched to these areas, the result is an increased demand for freight transport.

Furthermore, as urban freight transport deals primarily with the distribution of goods at the end of the supply chain, many deliveries tend to be made in small loads and in frequent trips, thus resulting in many vehicle kilometers. The urban environment is characterized by high settlement and population densities and high consumption of goods and services. In such environments traffic infrastructure and the possibilities for its extension are both limited and unsustainable. This dichotomy between demand and limitations of the urban environment has resulted in significant problems associated with urban freight transport. The most commonly mentioned are congestion, pollution, safety, and noise and carbon creation. In fact, the transportation of goods accounts for 40% of air pollution and noise emissions (COST321, 1998). The combined effects of these problems are both economic and societal, in that they not only reduce the efficiency and effectiveness of urban freight transport and logistics operations but also impact on the well-being of a nation by decreasing the quality of life of citizens and through detrimental effects on health.

One would expect that, because of its importance, this topic would have been given a more central role in European policy making. However, despite its significance and the problems associated with it, relatively little attention has been paid by researchers and policy makers until recently. Indeed, especially in the first half of the 1990s, "in the documents that the Commission has published to support the making of a common European transport policy, issues of city logistics have in fact been only rarely mentioned" (PORTAL, 2003, p.7).

Apart from the fact that logistics and urban freight is a hot topic nowadays, we have not found so far a clear definition of Urban Freight Consolidation that addresses some modern understandings on this concept, and therefore we shall specify this issue as a missing part to the current state of the art. Further to this discussion, we have not found so far a clear specification for the basic elements of urban freight consolidation system. In many cases experts argue that the system is too complex, so that is too difficult to identify a unified conceptual model and clear specification of the basic elements of

urban freight consolidation system. Therefore, for our purposes we shall simplify and assume that any urban freight consolidation system consists of:

- Origin and destination demand points within the urban area in question.
- Hubs that collect and distribute freight or in other words intermediate points that fulfil freight reassignment operations.
- Connections between origin and destination demand points and hubs (i.e., possible routes between origin, destination and intermediate points)

Looking closer at the foregoing three elements, one would be able to recognise the basic elements of urban freight consolidation system that form the physical and logical network for urban freight.

In the literature urban distribution networks and consolidation depots have been identified. For instance, in (Stantchev and Whiteing, 2006) the use of urban distribution networks and consolidation depots has been discussed. We shall concentrate on consolidation depots, next. The consolidation depots are the intermediate points that fulfill freight reassignment operations for the sake of the urban freight network service provided. One may find that these facilities are also called Urban Consolidation Centers (UCCs) in many sources.

3. URBAN CONSOLIDATION /Distribution/ CENTERS (UCCs): *What is it? What it does?*

Cities create and operate urban consolidation/distribution centers in order to:

- Reduce the number of delivery vehicles (especially dirty trucks and other vehicles using fossil fuels) operating in the central areas of the cities.
- Reduce greenhouse gas emissions from freight transport and improve air quality in the cities.
- Facilitate the operations with freight vehicles in loading/unloading areas within the cities and delivery bays.
- Reduce the conflict on the streets of the cities.
- Ameliorate delivery services to retailers (on time deliveries to date).
- Provide opportunities for added – value services to all the customers (services with no lost or damaged stock).
- Improve the quality of the entire service provided.

Many definitions of UCCs have been provided but very often they are vague or ambiguous. BESTUFS[1] reported (BESTUFS 2007, pp. 61) that: *Today, a UCC is best described as: "A logistics facility situated in relatively close proximity to the geographic area that it serves (be that a city centre, an entire town or a specific site such as a shopping centre), to which many logistics companies deliver goods destined for the area, from which consolidated deliveries are carried out within that area, in which a range of other value-added logistics and retail services can be provided."*

Next, the following recommendations regarding to certain extent the role of UCCs have emerged from the BESTUFS project (Huschebeck and Allen, 2005; Stantchev and Whiteing, 2006):

[1] BESTUFS is active since 2000 and is a Network-thought establishment found with the purpose of exchanging experiences and knowledge with colleagues in similar positions in other cities is an asset when starting your own innovative projects. This type of information has a better quality and often has more initiation power compared to the recommendations of external consultants. BESTUFS is facilitating the establishment of personal connections and the widening of contact networks in the field of urban freight transport for all interested persons - without imposing any commitments or formal structures. For further information the e interested reader is encouraged to consulate: http://www.bestufs.net/bestufs1.html

• Publicly-organized Urban Consolidation Centers (UCCs) do not have a good track record in terms of implementation and operation. For UCCs to be attractive to companies and to be successfully set-up BESTUFS recommends that they should be led and operated by one or several key commercial players that have identified the potential benefits of being involved. Similarly, public funding needs to be made available to pay for the research work and pilot studies for any form of UCC that is not related to a major new property or commercial development. Without this funding such UCC research and trials are unlikely to proceed.
• There is clearly a need for raising awareness (including success and failure factors) amongst local authorities, retailers and transport operators to enable them to add the UCC concept to their set of possible policy measures for consideration. BESTUFS recommends the active support of this awareness building process. This should be done by developing appropriate instruments (e.g. UCC planning guidelines or tools) as well as training measures for urban freight planners.
• BESTUFS recommends that governments should issue guidance to local authorities as to where consideration should be given to the establishment of UCCs when major development proposals are being considered and when town centers are being restructured.
• The standard objection to UCCs is that they will lead to increased costs in the delivery operation. It is therefore important to discuss the wider implications of such schemes with the road transport industry and retailers and to demonstrate that, by using such centers, costs in other parts of their operation could be reduced. Such reductions could be achieved through less time being spent on (expensive) town deliveries, shorter journey times and increased vehicle utilization, and the possibility of night-time deliveries (UCCs could be open when their customers are closed).
• One of the key financial considerations is how to allocate the costs and benefits resulting from a UCC scheme as a whole and not solely the cost impact in one part of the supply chain or a single player. This is not a simple matter and the allocation of costs and benefits needs to be the subject of a more comprehensive and detailed study and ideally one based on a fully measured pilot project. BESTUFS recommends setting up a study that would encompass both the financial costs/benefits along the whole supply chain and the wider issue of how to handle the environmental costs and benefits.
• When a UCC scheme is being considered there is a need for the detailed measurement of the flow of traffic and goods in the prospective location(s). This should be followed by a period of consultation about the precise nature of the UCC scheme to be tested, and then an extended pilot that is managed and scrutinized by representatives of all the potential players – the local authority, logistics companies, retailers and other users (at both a local and national level), potential UCC operators, and environmental lobby groups.

Undoubtedly, the foregoing recommendations that have emerged within/from the BESTUFS project demonstrate deep understanding of urban freight consolidation concepts and have thus established a solid foundation for further investigation. In our comprehensive state of the art survey, however, we wanted to discover more about:

- exact methodologies and/or approaches by which UCCs Management and Organizational practices/schemes could be studied adequately.
- extensive classifications of UCCs.
- reliable performance assessment approaches for studying the level of performances of UCCs.
- concepts of UCCs in a Geopolitical Network/Framework.
- UCCs in terms of “locked-in logistics”.

Unfortunately, we were not able to find satisfactory answers to the foregoing issues in the available literature and therefore a number of case studies from the real world were studied.
More specifically, we have studied:

- the Consolidation Centre in Heathrow, the UK.
- the Bristol Urban Consolidation Centre, the UK.
- the project for the London Freight Consolidation Centre, the UK.
- the project “Schone Stad”, the Urban Consolidation Centre in the Hague.

- the city of Fano, Italy.
- the historical city of Lucca, Italy.
- the city of Aalborg, City Logistics in North Denmark.
- the Cargo Centre, Graz, Austria.
- the German Experience with UCCs.
- La Petite Reine, Paris, France.
- the city of Hammarby, Sweden.
- Distribution Centers around Amsterdam Airport Schiphol, the Netherlands.

We shall provide a detailed discussion of these cases study analyses elsewhere, but generally speaking in all these cases where UCCs have been set up, our analyses suggest that they may fail more often that succeed, which is not promising.

We feel that suitable data samples should be collected from a couple of cases and performance assessment approach that might be based on Performance ratios, Benchmarking, Systems evaluations as well as Data Envelopment Analyses, should be developed and tested in terms of Urban Freight Consolidation Systems.

Next, speaking of classifications of UCCs, three distinct categories of UCC have been identified in BESTUFS, 2007, as follows:

1. Area UCCs - serving a town/city
2. UCCs on single sites with one landlord
3. Special project UCCs

We feel that considering the foregoing classifications of UCCs one should go further and suggest new classifications of UCCs according to different criteria.

Further analyses of UCCs in a geopolitical urban network/framework are needed in order to better understand the UCCs behavior within this frame.

It appears that too little is known on “locked –in logistics” and UCC performances. Questions that remain unanswered are such as: How a single UCC should be set up to avoid the phenomenon of locked-in logistics? How the urban network should be set up to avoid a single UCC to be locked-in? When it might be of interest to consider a setup of two UCCs over time? (...in heavily congested urban areas) How should two UCCs be set up to avoid the phenomenon of locked-in logistics? How the urban network should be set up to avoid either of UCCs to be locked-in? How the phenomenon of locked-in logistics is measured in terms of an urban network? How the phenomenon of locked-in logistics is modeled in terms of an urban network?, and the like.

4. CONCLUSIONS:

Missing knowledge to the current state of the art

The BESTUFS project has established a solid foundation for further investigation and recommended that in order to guarantee efficient and successful operations, urban consolidation centers should be led and operated by commercial players. Public funding, however, should be made available to pay for the research work and pilot studies in the setup stages. Roles and responsibilities of the various actors and stakeholders are important factors for the success or failure of the urban consolidation schemes. The UK example has shown that consolidation centres for airports or shopping malls have been instigated by companies but public sector authorities have been supportive.

Other issues resulting from the research projects include:

- The need to raise awareness of the UCC concept, especially of the benefits from cost reductions through the optimisation of other supply chain activities as a result of UCC usage;
- Increased co-operation and dialogue between local authorities, logistics companies, retailers, potential UCC operators and environmental lobby groups;
- The availability of decision-support tools for local authorities and transport sector companies such as examples of good practice and training software;

• In order to maximise the benefits from multimodal transport, in line with the EU policy of shifting the balance between transport modes and freight integration, the choice of sites in close proximity to railways and waterways should be encouraged.

Next, freight platforms, utilising the benefits of multimodal transport, are acknowledged to have wider positive economic effects in addition to solving urban logistics problems.

On the other hand, our surveys and analyses have further suggested that there is a missing knowledge to the current state of the art in terms of:

- exact methodologies and/or approaches by which UCCs Management and Organizational practices/schemes could be studied adequately.
- extensive classifications of UCCs.
- reliable performance assessment approaches for studying the level of performances of UCCs.
- concepts of UCCs in a Geopolitical Network/Framework.
- UCCs & "locked-in logistics".

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