

## BUDAPEST – ON THE WAY TO JOIN THE IDIOMA PROJECT

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### Abstract

As traffic volume increases continuously, problems appearing in this field need new kind of solutions. Old freight operation methods are often not satisfactory to the needs of new demands. This paper will show the opportunity for the capital Budapest to join the EU project in the fields of city-logistics: "Innovative Distribution with Intermodal Freight Operation in Metropolitan Areas (IDIOMA)". Summarising the objectives and the general project scope will help to find connection points to the current shape of freight transport in Budapest. Providing, analysing important data, and specifying the stressed fields for logistic operations the paper finishes with the already reached steps of the project assessment contribution.

*Keywords:* freight centres, intermodal transport, city logistics, waste management.

### 1. Introduction

The actual high transport volumes will still increase in the next years - some prognostics assume a growth of 100%. In particular, in urban centres the volume of traffic is causing already today serious environmental damage and health problems. The unbearable level of traffic worsens living conditions and, consequently, the quality of life of many citizens. As mobility of goods and persons is a base for economic wealth, innovative solutions are to be found to cope with the increasing traffic. Cities and regional administrations are forced to think of measures to support alternative transport concepts and to implement policies which will reduce the pressure on the city infrastructure and the inhabitants caused by the traffic.

### 2. The Objectives and Scope of the Project

IDIOMA (Innovative Distribution with Intermodal Freight Operation in Metropolitan Areas) is a demonstration project funded by the European Union in the Fourth Framework Programme contributing to find solutions for the increasing goods traffic in metropolitan areas. It is running from December 1998 to February 2001. With its five demonstration sites – Nuremberg (Germany), Öresund (Sweden/Denmark),

Paris/Ile de France (France), Randstad (Netherlands) and Zurich (Switzerland) ID-IOMA covers a wide range of projects. All demonstration sites have in common the co-operative approach of the projects: Both forwarders operating on road and/or rail and public administrations contribute to reduce the negative effects of goods traffic in urban areas [1].

The general objective of IDIOMA is to demonstrate the options to improve the distribution of goods within metropolitan areas and between intermodal transport terminals/freight centres and metropolitan areas. In particular this means that the demonstration tasks will show solutions for:

- the more efficient operation of freight centres by optimising the information flows to ease the transshipment of freight between the available modes and means of transport and the use of multimodal chains;
- the integration of small and medium sized enterprises (SMEs) and their specific requirements in freight centres and transshipment point concepts to push their active participation in offering intermodal transport services and
- the optimum organisation and the integration of telematics in the distribution process before or after a long haulage intermodal transport leg to achieve sustainable freight flows in urban areas and to reduce the environmental impact.

IDIOMA subsumes different situations at five European test sites with different prevailing conditions. It supports the exchange of experience between the participating actors and encourages other cities to benefit from its results and to implement measures for a more efficient and environmentally sound freight distribution.

The IDIOMA project is realized in commission by DG VII (its new name is DG TREN: Transport and Energy) and DG XIII (Telematics) of the European Commission.

The IDIOMA project aims at influencing the policy process by showing the best practices in the area of intermodal urban freight transport. The objective of this chapter is therefore to present a general overview of European policies in the field of urban freight transport including intermodal transport in cities. The initial problem is that there is not one single urban freight transport policy in the EC to describe but many urban freight transport policies. Urban freight transport is more than other transport activities, it is a subject of local, regional and national policies in different policy fields, such as transport planning, environmental planning and economic planning. The policies, therefore, are different in the various countries and have changed over the time.

A few figures are to be mentioned about urban Europe. Around 20% of the population live in large conurbation of more than 250,000 inhabitants, a further 20% in medium-sized cities of 50,000 to 250,000 inhabitants, and 40% in areas with 10,000 to 50,000 people. Important differences in economic structure and functions, social composition, population size and demographic structure as well as geographical location shape the challenges which urban areas face. National differences in traditions and culture, economic performance, legal and institutional arrangements and

public policy have an important impact upon cities and towns. There is no single model of a European city.

### **3. Budapest, as a Follower City of the Project**

To the follower city activities belong mainly the following four objectives:

- to make an overview of the status of the city of Budapest in the field of urban goods transport and pre- and endleg of intermodal activities (presented in Chapter 4);
- to present IDIOMA developed ideas in the context of Budapest;
- to present experience and ideas from Budapest on the pre- and endleg of intermodal activities;
- to provide results to the final IDIOMA reports.

In order to achieve the mentioned aims, the following steps have to be worked out:

- To overview the status of the city, Budapest with special respect to its freight flows and freight traffic distribution system (already done, to be demonstrated in the following chapter).
- To identify the actors, the possible stakeholders of the system (already done, as shown in the following chapter).
- To work out a questionnaire to be distributed and completed by the potential participants.
- To collect data and produce them.
- To compose and analyse different clusters of the freight traffic flows according to the type, the place, the quantity, the quality and the frequency of the transported goods.
- To identify the bottlenecks of the freight traffic flows considering the capacity of the transport network of the city.
- To make proposals for increasing the effectiveness of the transport chains, the implementation and evaluation of the economic efficiency. The dissemination of the results.

## **4. Overview of the Available Research Results**

### *4.1. Transport Policies, Changes and Main Processes*

The transport development of Budapest is an organic part of the compact urban development process which aim is to increase the quality of life in parallel to the operational efficiency of the city, with a careful consideration of the conservation of the natural and built environment.

The main principles of the existing development plan of the city are:

- unification of regional and transport planning,
- integrated network and operation planning,
- managing the demand for mobility,
- regulation of the direction and intensity of the traffic flows,
- user-friendly installation of the transport infrastructure,
- harmonisation of the quality of transport and environment [2].

The new approach of the development plan combines searching for the best solutions for construction of the missing elements of transport infrastructure with more efficient utilisation of the existing ones and continuous management of the demand for mobility.

Due to the geopolitical position of the capital is attributed an important role to the transport system. The development of Budapest was in the past and will be in the future always determined by the quality of its transport connections. Budapest may become an international centre of the region because of its excellent multimodal links to other main and subcentres of larger distance, like its road and rail connections, supported by the waterway of Danube and the Ferihegy international airport (see the IVth, Vth, VIIth and Xth transport corridors of the Trans European Network). The transport network of the region is suitable for creating the conditions of a production, consumption and distribution center.

The economy of Budapest is continuously developing and changing. 35GDP of the country has been produced here. The number of operating companies in the capital is more than 230 thousand. 60billion USD) in the last decade was concentrated here. The changing structure of the economy and employment has reshaped the layout of the region and the characteristics of the mobility. The city inherited a rather well developed road and public transport network.

The political and economic changes in the last decade had a significant influence on the transport system of the city. In the previous regime, public transport played a dominant role in the urban living conditions. Public transport provided the mobility for the majority of the population with very good accessibility, frequency and low level of tariff.

After the radical changes in the economic and political systems, the modal split became significantly worse. According to the last household survey the ratio of the public transport and the individual transport is 60 to 40% while it was 80 to 20% at the end of the last decade.

The major problems are the followings:

- car ownership has grown significantly,
- more intensive use of cars in some entrepreneur groups,
- formerly state-owned large-size companies have been closed and thousands of SMS new companies have been established,
- new activities appeared in the city centre (offices, banks, insurance companies),
- more demand for than supply parking facilities.

Changes taking place in the economy and commerce had a multi-part effect to the good-supply. As production and good transport decentralised, the number of small enterprises increased, and this caused the decentralisation of good supply operations. At the same time, some shopping centres have been built, particularly in the outskirts of the capital, which means a kind of concentration of supply operations. All together, today is represented by the continuous changing position of commerce and goods transport, having now an intermediate shape: beside the historical old methods there are examples of ordering systems using virtual communication and the world-wide web.

In the capital there is no well organised supply method, collecting and distributing system and the goods supply for shops is different in nearly all kinds of articles. The increased number of goods supply transports causes bigger and bigger traffic on the roads. The most characteristic feature of freight transport is the lack of organisation, the usual tool for regulation is making restrictions. The greatest part of commercial institutions is still in the city, this is why the traffic increasing effect of good transport, loading and unloading causes the greatest problems in the most jammed part of the capital.

Shopping centres in the outskirts have a decreasing effect to the transports directed to the city, but this is balanced by other processes, so the volume of supply traffic had only a small change during the past years. The number of the drive in permissions handed out in the city has showed no change at all. The reasons for this are:

- restructuring shop profiles to reach more customers, and
- possible decline of some goods' proportional rate in several shops has no influence on the number of transportation vehicles.

Still, shopping centres accommodated in the outskirts attract significant freight traffic with an average of 3,000-3,400 vehicles per month, which means about 100-140 vehicles a day. 54% of the whole transport needs is carried out by freight vehicles, the second biggest part belongs to smaller freight vans (42%), and only 4% to trucks.

As a result of the increasing number of shopping centres, the last part of the supply chain is carried out by customers and inhabitants, taking the goods from the shopping centre to home by own car. This part of freight transport cannot be monitored by the ordinary methods of logistics administration, at the same time it provides a significant surplus in road traffic.

#### *4.2. Important figures in general and about the freight traffic in Budapest*

At the end of the 20th century 62% of the total population of Hungary live in cities and towns. The distribution of the population in the cities of different size reflects the specific impacts of the history of the country. More than one fifth of the total population, 2 million inhabitants live in the capital and in its agglomeration but the second largest city of the country, Debrecen, has only 200,000 inhabitants and

besides these two ones, only seven other towns of the country have more than one hundred thousand inhabitants.

Data from 1997 shows that food consumption in Budapest was 700 kg/person/year which means about 2 kg/person/day. To cover this demand, in the whole year the city reached 128,000 tons of goods as total freight traffic performance (this makes about 430 tons per day). For the whole area of Budapest this number is 1,303,000 tons per year (4350 tons per day). Waste taken out from the capital was 4,450,000 m<sup>3</sup> per year (1997) of which municipal waste was 2,880,000 m<sup>3</sup> (about 5 litres per person per day).

30% of all loading and unloading processes in Budapest take place on the public roads, 67% of these processes using dedicated loading and unloading places. The traffic disturbing effect of freight transport and loading is increased by the fact that 90% of all freight transport is carried out during working hours. Receiving goods not during the opening hours reaches not more than 10 percent of all freight transport. In the town exist 421 dedicated loading and unloading places, each of which belongs to 3-4 shops or store.

The whole weight transported within the city is 17% higher than the one transported from the country to the capital, at the same time, traffic performance (thanks to the three times longer transport routes) from the country to Budapest is twice higher than the traffic performance within the town. Average transport distance within the capital is 29 km, from the country to the capital the figure shows 77 km. Taking the country data into account, the transport distances within the capital are too long.

During the whole year the percentage of empty running vans does not fluctuate, within the city this figure is 45.5%, coming from the country 33.4% as an average. This means a low average utilisation of vehicles within the capital.

About railway freight transport is important to mention that 60% of all station freight traffic in Budapest is unloaded, the rest (that 40%) is loaded goods. This shows, that the net flow regarded the railway freight transport is coming to the capital. However, railway freight transport does not play a very important role in the town's freight flow: only 14.3% of all incoming weight is transported by trains, which hardens the question of air pollution.

### *4.3. Simple Solutions*

Loading places are signed with suitable boards, but the effectiveness of these boards is poor: parking cars occupy the free place frequently. Because of this, loading is carried out using the traffic lane, disturbing the traffic significantly.

The zone-system introduced in the eighties has the task to regulate the dispersion of freight traffic in time and space, decreasing (and in several critical places even terminating) transit freight transport. Full truck weight restrictions implemented in the zone-system push heavy truck traffic to the low traffic hours in order to establish a possible undisturbed daytime movement on roads.

Since 1996 there is a new full-truck-weight-limit system regulating goods transport:

- in Pest between the upper quayside (felső rakpart) and the middle ring road ((Nagykörút), in Buda between the upper quayside and the Buda Ring Road (Budai körút) there is a 3,5 ton full truck weight limit from 07 a.m. till 06 p.m.
- between the middle ring road (Nagykörút) and the outer ring road (Hungária körút) there is a full-weight limit of 12 tons again from 07 a.m. till 06 p.m.
- in the 9th district in Buda has been introduced a full-weight-limit of 12 tons. The characteristic freight transport routes and the full-weight-limit zone-system is shown on *Fig. 1*.

There are no overall and exact data available in connection with the freight, material and waste transport in Budapest and its agglomeration. As a result of more measurements systematically carried out on the main roads, the volume, dimension and composition of freight traffic are well known. The last direction flow measurement was carried out in 1992-1994, but since then the flow relations and parameters have been changed considerably. To follow these, new complex traffic measurements are taking place in the capital and its region. Data already available is processed permanently. Important data can be found also in the “Traffic Development Plan of Budapest”, too.

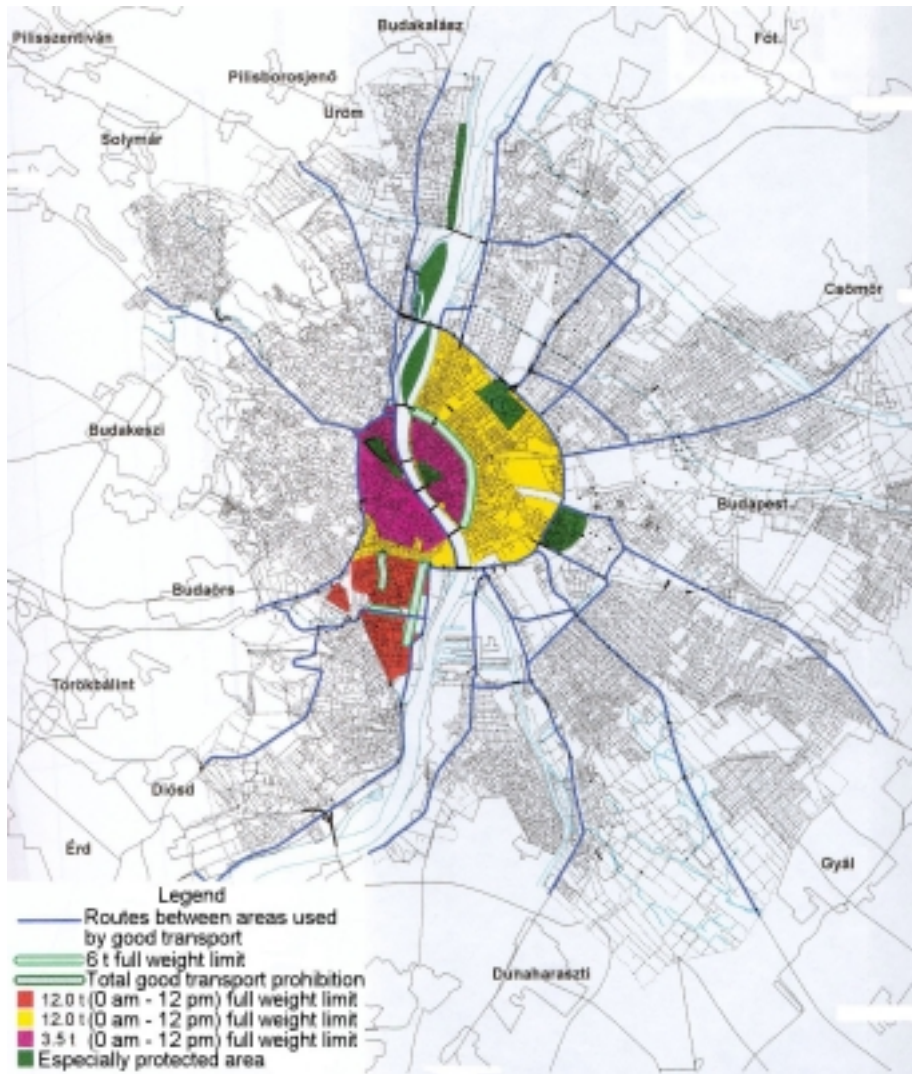
#### 4.4. Important Freight Transport Centres

Starting and destination points of the freight transport in Budapest are mainly old industrial areas, where reconstruction aims, first of all, at logistic, warehousing and freight traffic centres. These areas are mentioned in town development plans:

- industrial basin Nagytétény (Nagytétényi ipari medence),
- Csepel island,
- logistic area Soroksár,
- Kőbánya, Jászberényi-Maglódi street,
- Cinkotai street-Bökényföldi street,
- Újpalota, Késmárk street,
- Rákospalota, Székely Elek street,
- industrial basin Kaszásdűlő (Kaszásdűlői ipari medence).

These will provide the centres and sub-centres of city logistics in the future, as shown on *Fig. 2*.

The logistical potential of the industrial basin Nagytétény is based on the Danube as a big-capacity waterway, the railway lines to Székesfehérvár and Püspöcsanak, the access part of main road number 6 (later on a motorway), and the southern section of the ring road M0. Apart from these, favourable public traffic connection is available between the logistic area and the city centre. First of all, the Budapest Harbour Park is going to be built out on enterprise basis, after this



*Fig. 1.* The different freight zones in the capital

the ROLA and RORO terminal is going to be established, working as a “logistic engine” of the area. On the field of the former pig farm in Nagytétény logistics centre will be built out in two steps, finally 250,000m<sup>2</sup> as total covered surface. The container- harbour planned next to the venture park will be established in the first step on a field of 10 hectares. Co-operation and function sharing will take place between the two area. The two project can help to change function of the empty areas of the industrial basin Nagytétény.



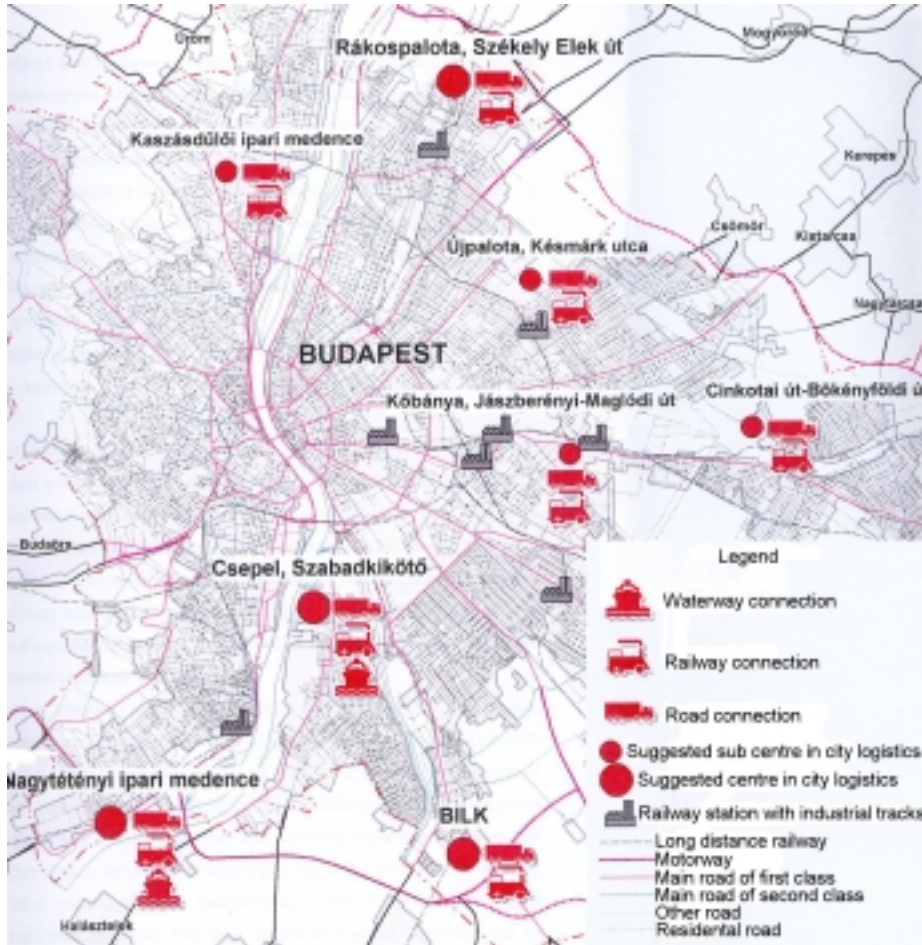


Fig. 2. Planned important logistic junctions in Budapest

The most important facility of the Csepel area is the Danube harbour. Right now it is only possible to access it through a built up area. Rail traffic also disturbs the inhabitant traffic in the district even if rail traffic volume has been decreasing for nearly 10 years. Road connections between the area and the city are acceptable, but industrial and public transport between this region and other industrial/logistical areas have to be developed soon. If freight traffic increases, cross-Danube road capacities might need further developments. The harbour will have to act as the waterway connection for the Budapest Intermodal Logistic Centre (BILC) in Soroksár.

Heart of the Soroksár logistic area is the already mentioned BILC, some parts of which are already realised (railway connection tracks), and planning is in the final

stage. The area can be found between the southern section of the ring road M0 and the railway line to southern Hungary (Kelebia). Road connection with the city centre is well established. The BILC is going to be the most important logistics centre of Hungary, and will have tasks coming from other central European countries, too. Areas around BILC are now changing their function, approaching auxiliary logistical duties. Already more logistic service providers as well as shipping agencies, and warehouses have settled down in the region over the old industrial fields. As the district is in possession of free manpower, besides the central BILK project more other entertainment companies are expected to settle down in the neighbourhood.

Connections between northern Kőbánya and the city or other freight traffic sources are not suitable. As the eastern section of M0 does not exist yet, the yard can only be served through residential areas. In harmony with earlier ideas about the line of M0, next to the Tündérváros street warehousing capacities have been created. The area still has great reserves, much of which will be only used after improving road connections to other parts of the town. After saturation, free capacity can be offered by the northern industrial area of the 10th district (Jászberényi street – Maglódi street). Investments on this ground, however, need higher capital for pulling down old industrial plants.

The Cinkotai street – Bökényföldi street has even worse traffic connection with other parts of the capital than the previously mentioned Kőbánya. Still, in the district settled environment already at its starting time contained a wide range of important transport companies (like Hungarocamion, Budapest Traffic Company, Hungarian Post). Important logistical role can be realised only after building out the eastern section of M0.

Késmárk street in the 15th district has an advantageous position, but is to be found between residential areas, which has reduced the expansion options of incoming companies. Although the starting section of the M3 motorway is near the yard, it can only be reached through residential areas, disturbing inhabitants.

Among industrial grounds in the northern – eastern part of Budapest, Rákospalota has the most favourable features. The warehouse district lies between the M0 ring road and the railway line to Szob. Yards next to the Székely Elek street have been utilised by warehousing and wholesale firms. Further enterprises of this kind are expected in the future. In short run, rapid development in the road infrastructure is expected, which will facilitate the “moving in” activity of some new companies. The warehousing basis can be soon reached without disturbing residential areas.

Basin Kaszásdűlő is “closed” from all sides, it is hard to reach. After building out the M0 ring road it will be possible to separate industrial traffic, but the connection to other industrial areas will be still behind the desired standard. Changing the old industrial functions, some new enterprises have already moved in, providing logistic services, warehousing and wholesale trade.

The introduced areas are developing differently, but all of them show a significant movement towards logistics. In many cases relationship to residential areas and environment determines the chances of companies settling down here. The classic logistic services exist only in the area of southern Budapest, where ordinary connections with the city and other areas are already established. Firms using the

northern and eastern areas mainly are wholesale traders, only with poor logistic services [3].

#### 4.5. *Data about waste management in the capital*

Systematic waste gathering takes place for nearly all flats in the capital (99,8Q%). Since 1990 the transported volume of waste increases by 10% every year, in 1998 it was 4,360,000 m<sup>3</sup> per year. The task is performed by 150 special waste carrying vehicles, which have a load weight of 24-26 tons and have 3 axles. Daily transport performance is about 85 m<sup>3</sup> per car. In average, the vehicles are 10 years old, but their technical condition meet the European standards. 60% of the waste arrives in the waste-burning plant in the 15th district, 40% in the waste depot between Dunakeszi and Fót. Average transport distance is about 21-25 km.

Collecting waste is carried out with 50 vehicles in the city between the middle ring (Nagykörút) and the Danube from 5 till 7 o'clock in the morning, after this it is continued on the Buda side and between the outer ring (Hungária körút) and the middle ring (Nagykörút). Vehicles move after a planned timetable, full loaded vehicles reach the burn-plant using an advised (but not compulsory) route. Traffic jams happen often in the morning in the city and in one way streets outside the middle ring. Many times happens that waste loading needs the traffic lane, too, this makes difficulties for drivers. Data about systematically emerging traffic jams have not been collected yet [4].

#### 4.6. *Stakeholders of the project Budapest*

Main actors of the project has to be identified in order to be able to organise work. Different parties have to be represented among the stakeholders, otherwise it is not possible to collect all necessary data, to analyse them, and to find innovative solutions for the key problems. Following scientific, governmental institutes, and private companies have been considered as interested participants in the project:

- The project of "Follower City Budapest" will be lead by the Department of Transport Economics at the Budapest University of Technology and Economics. The Department of Transport Operation of the same university will be also an active contributor to the project.
- The Logistics Directorate of the Ministry for Economics will be participating in the project as the representative directly of the government and indirectly of the legal regulation.
- The Transport Directorate of the Municipality of Budapest responsible for managing transport related issues of the capital and its agglomeration.
- The freight transport operating companies of the region (e.g. Hungarian Railways, etc.).
- ESRI Hungary as the representative of the IT companies.
- All the private commercial and retailer companies working in the region.

## 5. Summary

As shown in this short report, the Hungarian capital, Budapest has many tasks, problems, difficulties about freight management, but, at the same time several solutions are already provided, and at some places significant developments have been undertaken. To play the role of a great metropolis many questions have to be answered in the field of supply chain management, logistic centres, service providers, private enterprises and town traffic management. The town government has to play an important role, but many other tasks can be performed by private companies. Developing adequate methods in co-operation with the existing human resources and education can help to obtain a more effective social yield provided by the recovery of the Hungarian economy.

Already reached project results are:

- detailed description of current freight transport volumes,
- main freight transport routes within the capital Budapest,
- possible logistic and goods transport centres and their circumstances,
- identified stakeholders.

As shown in chapter 3, there are 5 more steps to be fulfilled till the project finishes. The scientific results can be the topic of the next published paper. These should show solutions for:

- a more efficient operation of freight centres by optimising the information flows, to ease the transshipment of freight between the available modes and means of transport and the use of multi-modal chains,
- the integration of SMEs and their specific requirements in freight centres and transshipment point concepts, the offer intermodal transport services and,
- the optimum organisation and integration of telematics in the distribution process before or after a long haulage intermodal transport leg to achieve sustainable freight flows.

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