

# Stakeholders' Contribution in Coordination of Passengers' and Goods' Flows within the Urban Areas

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## ABSTRACT

Cities are becoming congested due to migration from rural areas, emigration from overseas as a result of globalization. The inspiration for the research problem discussed in this study is increasing need of looking for the solutions in improving mobility within the urban areas. With the growth of cities and urban population, city authorities all over the world focus on preparing the conditions for better living in urban areas. But it can't be forgotten, the local authorities are only the part of all actors engaged and exposed to mobility problems. The main aim of the study is to find out how to solve problems of improving passengers' and goods' mobility in Polish urban areas. After defining all groups of parties involved in mobility problems, the author is going to achieve the goal by conducting semi-structured interviews with urban-planning and sustainability experts as well as government officials and other groups of stakeholders. Moreover the research is going to be carried out on the analysis of the practical solutions in the field of mobility in cities in European urban areas, documents of the European Commission and the publications prepared by industry associations. The theoretical part of the paper is based on the existing materials from public resources and author's research experience. The findings of the research is going to present the solutions of the better and more sustainable mobility in urban areas that can be successfully implemented in Polish cities in the area of mobility while meetings the demands of all stakeholders engaged.

*Keywords: transport organization, metropolitan areas, city logistics*

## 1. Introduction

The United Nations Organization predicts that by 2050, nearly two-thirds of the world's projected 9,7 billion population will have been living in urban areas. In 2008 more people lived in cities than in rural areas. Because of demographic conditions and the high rate of urbanization all over the world, the importance of processes taking place within city areas is still growing, making city management more and more complicated (table 1).

**Table 1.** World's population by size class of settlements, 2016 and 2030

	2016			2030		
	Number of settlements	Population (millions)	Percentage of world population	Number of settlements	Population (millions)	Percentage of world population
URBAN	--	4.034	54,5	-	5.058	60,0
10mln or more	31	500	6,8	41	730	8,7
5 to 10mln	45	308	4,2	63	434	5,2
1 to 5 mln	436	861	11,6	558	1.128	13,4
500.000 to 1mln	551	380	5,1	731	509	6,0
Fewer than 500.000	-	1.198	26,8	-	2.257	26,8
RURAL		3.371	45,5		3.367	40,0

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The development of urbanization and increase in the number of people living in cities causes the growing problems in passengers and freight transport within the urban areas. Transportation resulting in traffic congestions and the increased levels of air pollution considerably worsen the quality of living conditions in cities. At present 67% of passenger transport has been taking place in urban areas, by 2050, the number of kilometres travelled in urban areas will have been tripled.(fig. 1). The same trends can be observed in freight transport. (Urban Logistics, 2015).

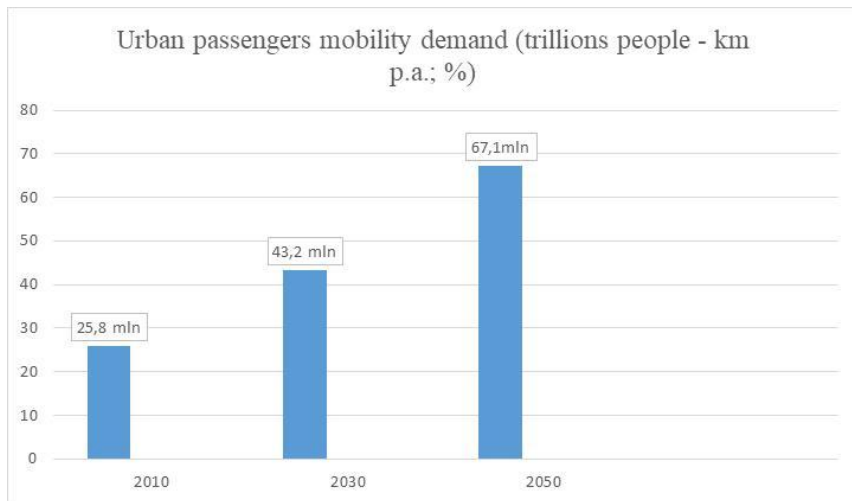


Figure 1. Urban passengers mobility demand, 2010-2050

In response to these problems, a number of European initiatives in the area of city logistics were introduced. The problem is, the majority of them, focus on freight transport and internal effects related to its activity. The lack of holistic view on city logistics problems related to the flows of people as well as goods is observed. Thus it is really important to highlight the coordination of passengers and goods transport, integration and synchronization of transport in urban areas are the questions of interest in the field of urban logistics, which comes as a tool for solving problems related to the management of highly urbanized areas.

The article aims at finding out how to solve problems of improving passengers' and goods' mobility in Polish urban areas. The paper is constructed as follows. After defining all groups of parties involved in mobility problems, the author is going to achieve the goal by conducting semi-structured interviews with urban-planning and sustainability experts as well as government officials and other groups of stakeholders.

## 2. Urban Transport System

Transport is one of the key sectors in urban development and very often, in many cases it reflects the level of country economic development. Efficient urban transport is essential for the quality of life in cities and for its economy but is often neglected in urban policy and planning. In case of transport disturbances the possibilities

of citizen moving decrease, and economic loses in different are experienced in different economy sectors. In case of constant transport disturbances different difficulties may occur concerning (Susnienė, 2008):

- using resources,
- labour diversion,
- people's economic welfare,
- people's quality of life,
- impact on environment.

What is very important to highlight - the sustainable development of urban transport system should be able to meet the needs of main stakeholders – citizens and businesses, making a positive impact on the environment and additionally be socially fair and economically efficient. Transport in cities emits approximately 23% of transport CO<sub>2</sub> – a quarter of which is emitted by freight urban transport. The short distances, regular start stops and the large number of people exposed to the air and noise pollution provide an opportunity for urban transport system to make an significant contribution to improving flows of passengers and goods within the city areas. (Heeswijk, 2017).

In spite of that urban freight transport tends to be most problematic area in urban transport system, it can't be forgotten that attractive and efficient public transport is an integral part of the modern transport system. So, the urban transport system consist of freight transport and passengers transport and shouldn't be analysed separately. Intermodality, multimodality and integration in urban transport system, play a central role in achieving efficient transport systems and improving mobility flows. In creating efficient transport system, passenger as well as freight transport should be considered.

Thus urban transport should be understood in a very wide way and urban mobility should be treated as a whole and should include (Wytse, 2011):

- all transport means,
  - private cars,
  - taxis
  - collective transport means,
- and also softer transport modes like 2 wheelers and walking.

The best solution in creating and managing urban transport system, related to the passengers and freight transportation, is integrated approach involving planning processes, especially land use and transport planning, and engaging all stakeholders in different stages of planning process (ECTRI, 2007), (fig.2).

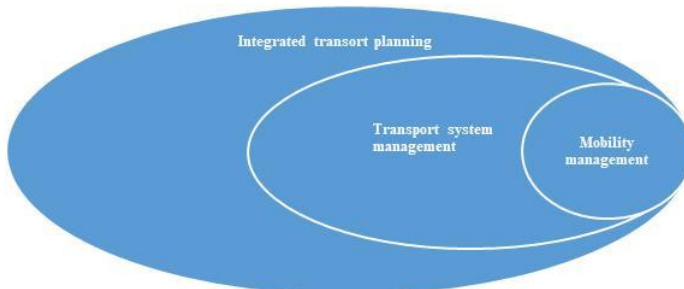


Figure 2. Levels of integrated planning process

Without the comprehensive and right vision and as well the stable transport policy, it is difficult for all stakeholders engaged in urban transport system to see the need to implement solutions in this area. (Nesterova, 2016). While there is a general consensus on the problems of city transport and there is also widespread agreement on the possible solutions to these problems the solutions are not implemented in a systemic way. So, clear strategies are needed in the area of urban transport system which should set out the objectives clearly and the measures that should be implemented to reach them. Implementation of all measures should be regularly monitored, revised and reviewed. To improve urban transport system, city authorities as well as the rest of stakeholders should remember they have a common interest to optimise urban transport, which is difficult to reach while operating in insolation and without necessary agreement.

### 3. Stakeholders Engaged in Urban Transport System

Congestion and environmental problems caused by passenger and freight transport is observed in many European cities. For many years such problems were mainly discussed from a narrow perspective of private stakeholders. Public authorities were working within their own area mainly concerning internal effects of transport businesses. It was a lack of holistic point of view, treated all parties involved in urban transport system as a whole. (Russo, 2011).

Cooperation in city management process in the way to improve flows within the city areas is essential. thus, there is a strong need to identify all stakeholders engaged that are going to be included in the cooperation. Heterogeneous stakeholders living in cities, in fact, interact, both competing and cooperating, and, often, are characterised by different objectives. (Lindholm, 2014). Stakeholders can be generally described as those who are interested in the decision to be made, even if they are not the final decision-makers or they don't play a formal role in the decision making process. (Anand, 2014).

The stakeholders pertain both to the private and public sphere and can be divided into several main groups (Taylor, 2005):

- 1) authorities,
- 2) shippers,
- 3) freight carriers,
- 4) public transport operators,
- 5) residents,
- 5) other traffic participants.

Within the authorities group the following stakeholders can be distinguished (Rodrigue, 2013):

- the local government,
- the national government,
- and for some issues even the European Commission.

The local authorities focus on an attractive city. From that perspective urban freight transport can be considered as a main contributor of pollution and nuisance. On the other hand, the local authorities aim in having an effective and efficient transport system. Local authorities are mainly interested in the reduction of congestion and environmental nuisances ad also in increasing safety of road traffic. The local authorities are the

stakeholders that consider urban transport system as a whole. Thus their main scope should focus on resolving problems between others actors engaged. National authorities are usually rather only marginally involved in urban freight transport as it is mainly seen as a local matter. However, the interests of national authorities (such as reducing congestion and externalities at a national or regional level) affects many urban freight transport operations as well as local authority policies.

Shippers generate freight demand, so their role is organizing freight transport from shippers to receivers. They are all driven by private interests. Shippers send goods to other companies or persons and are often not located in the city; as a result they usually do not feel responsible for urban freight transport issues. Their scope is to maximise their levels of service in terms of costs and reliability of transport. Shippers can be owners of the freight or they can be just responsible for hiring a carrier. (Dablanc, 2007). Freight carriers usually aim at minimising their costs by maximising the efficiency of their pick-up and delivery tours, and they are expected to provide a high level of service at low cost. There is a trade-off between a high level of service and the efficiency of freight vehicles loads. Transport operators are the stakeholders carrying out urban freight transport, but in many cases they are restricted by boundaries set by others; for example, opening hours of stores or designated time windows to make the deliveries. Transport operators are often active in a geographically larger area than the city. (Taylor, 2005).

Public transport operators are most commonly owned by the municipalities but in details it depends on the model of the public transport adopted in the urban transport system. That's why in the most universal models, they had options of performing the services themselves, in house, acting as an operator themselves or contracting out the service to private companies. In practice it means the public transport services may be provided by a mixture of private and publicly owned companies. (Holmgren, 2013).

City residents and city users are the people who live, work, and shop in the city. Residents can experience nuisance by urban freight transport as smell, noise nuisance, or vibration, so they are interested in most sustainable urban transport system.

The group of other traffic participants consists of vulnerable road users as cyclists and pedestrians that share the same infrastructure as freight transport vehicles especially in the urban area, and of passenger vehicles that are hindered by double-parked trucks involved in loading and unloading at the kerbside or on the road. As well visitors and tourists can be included into this group. They are also affected by urban freight transport only to a minor degree. Taking into account, having an attractive city which tourists and visitors want to visit is important, and there is therefore an interest in minimising nuisance by urban freight transport.

#### **4. Coordination of Goods and Passengers Flows within the City Areas**

The desired feature of managing urban transport processes is the integration of flows of goods and passengers in urban areas. The implementation of the integration concept of freight and passenger flows should ensure optimal conditions for living in metropolitan areas, while taking into account the costs, efficiency and services provided to business entities in accordance with the environmental objectives. The aspirations to integrate flows in both passenger transport and cargo transport as well as integration in

the organization and management of these flows should be associated with the pursuit of transport and communication objectives such as (Kaszubowski, 2014):

- development of an integrated system of freight and passenger transport,
- finding possibilities for the implementation of the transport policy assumptions in an efficient way,
- rationalisation of costs which are related to the functioning of the transport system,
- satisfaction of needs expressed by freight shippers and passengers of public transport,
- providing services of higher quality than services provided in the situation of transport disintegration,
- reducing the nuisance related to transport congestion,
- increasing the road infrastructure capacity,
- reorganization of flows of passenger and cargo,
- relieving the city's transport infrastructure by entering transit to the beltways

Within integrated urban transport system, it would be possible to achieve significant benefits, not only for the recipients of services, but also visible in the structure of the entire transport system. System benefits may be related to (Rześny-Cieplińska, 2013):

- sustainable development of transport, following pro-ecological demands,
- reduction of transport costs,
- the economic growth of the area.

Benefits for recipients of services occur in the form of (Rześny-Cieplińska, 2013):

- higher quality of offered services within the integrated transport system,
- increasing the attractiveness of the transport offer,
- better price and quality range,
- lowering the prices of transport services,
- access to the organizer's comprehensive offer,
- access to full information on transport possibilities,
- developing and providing information on the functioning of transport.

## 5. Measures and Solutions within Urban Transport System

Making changes in complex system such as urban transport system is a very complicated process. It is caused by several reasons. One of them results from diversity of stakeholders engaged with different scopes, sometimes conflicting. (lePira, 2017). Furthermore, it is worth emphasizing, no single stakeholder has a comprehensive vision of the urban transport system, nor what the effects of stakeholders cooperation, policy-measures or other interference are or will be. Cities that regularly organize comprehensive consultation with interested parties involved in the urban transport system, can benefit from the results, in both the short and long term. (Nesterova, 2016). The vision of the efficient urban transport system must comply aims of all stakeholders, but most often it is constructed partly by public or private actors engaged in urban transport system.

All the problems within this area could be solved by implementing different technical, organizational and economic measures and solutions for urban transport problems that may help to achieve the objectives of sustainable urban mobility. The potential initiatives can be classified into six main categories (Civitas Wiki 2015), within each of them

detailed measures can be listed (Urban logistics 2015):

**1) regulatory measures (group R):**

- restriction on vehicles (R1),
- exclusivity zones (R2),
- environmental restrictions (R3),

**2) market-based measures (group M):**

- pricing (M1),
- permits and mobility credits (M2),
- incentives and subsidies and taxes (M3),

**3) infrastructure (group I):**

- nearby delivery areas (I1),
- collecting points (I2),
- centers for consolidation of goods (I3),

**4) eco-logistics (group E):**

- eco-driving (E1),
- greener trucks (E2),
- alternative transportation means (E3),

**5) new technologies (group N):**

- real-time information (N1),
- system and traffic control systems. (N2).

The studying of European Commission rapports contributed to the urban transport measures implementation and conducting interviews with city administration representatives, allowed to define main aims to achieve by stakeholders, conditions of their achieving and to adjust the best corresponding measures.

**Table 2.** Main urban transport stakeholders' aims and conditions of their achieving

Stakeholders	Aims	Conditions of achieving	Potential measures to be applied
Authorities	-focus on attractiveness of the city, -securing city accessibility, -having an effective and efficient transport system, -reducing congestion, environment nuisance, -increasing safety of road traffic, -resolving problems between other stakeholders,	-achieving environmental standards, -efficient use of urban road network,	R1, R2, R3
Shippers	-growth in profit, -maximising levels of service in terms of cost and reliability of transport,	-reduction of the total cost, -growth in sales,	I1, I2, I3, N1, N2 R2
Freight carriers	-efficient and sustainable transportation of goods, -growth in profit, -minimising their cost by maximising the efficiency of their pick-up and delivery, -providing a high level of service at low cost,	-reduction of transportation cost, -growth in sales,	I1, I2, I3 N1, N2
Public transport operators	-ensuring punctual and frequent public transport, -growth in amount of customers,	-improving service quality,	N1, N2 R1
Residents /passengers /other	-ensuring good living conditions and environment,	-reduction of negative on living environment, -reduction of travelling time within the city,	R1, R2, R3 E2, E3 N1, N2

The table presents aims of all stakeholders and conditions of their achieving. The fourth column represents measures which implementation would help in achieving detailed scopes. The most essential conclusions from the analysis show there is a strong difficulty in finding uniform cocktail of solutions meeting goals of all stakeholders. Aims of authorities and passengers can be achieved mainly by regulatory measures. Shippers, and freight carriers' scopes can be satisfied by implementing infrastructure and new technology solutions. It looks most difficult because of financial expenditure needed. Partly it as well concerns public transport operators activity.

## 6. Discussion

The significant role of transport among tasks carried out within the framework of the metropolitan area management concept, poses a question about the proper directions of urban transport system development. One of these directions is the creation of an integrated transport system in accordance with the assumptions of urban logistics. Integration of urban transport is necessary and seems to be socially and commercially desirable. The arguments against disintegration of transport, cited in the literature, additionally reinforce the need and significance of integration activities in various cross-sections. (Grzelec, 2011). It is recognized that transport disintegration reduces the efficiency of transport, causing an irrational division of transport tasks, contributes to unnecessary costs or generating costs at too high level. Disintegration, also significantly reduces the attractiveness of transport and its competitiveness, exposing users to large nuisances. There are different fields that can be related to the urban mobility improving process. At least five elements can be considered:

- human beings,
- vehicles;
- transport providers,
- public intervention;
- infrastructure design.

This list is not complete and exhaustive but it can't be forgotten that an efficient interaction between all stakeholders is the most important for responsibility in bringing the best solutions to the identified urban area mobility problems. So just fulfilling the needs of mobility for citizens and businesses in a way that is environmentally sustainable and economically efficient depends on comprehensive planning process engaging all parties and stakeholders of urban transport system.

## 7. Conclusion

Many cities ignore need of urban transport system treating as a whole passengers and freight flows. City authorities rather focus on passenger transport area, private stakeholders tend to pursue economic and financial goals without establishing any agreements in the area of common urban transport system.

There is a growing recognition of numerous measures for urban transport system that may help to achieve the objectives of sustainable urban mobility. Some of them were successfully adopted in European cities. A number of different solutions within urban



transport area were analysed from the point of view of all stakeholders involved in urban transport system. The results of the study demonstrate that it is really difficult to find the most appropriate urban transport improving solutions taking into accounts scopes of all sides engaged. The research and author's experiences show the best way is to coordinate an urban transport system by the authorities trying implement different measures satisfying separate groups of stakeholders. In this area it is really possible to achieve partial goals that may be satisfying and treated as a first part of long-term process.

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