

# Changes in Transport Related Behaviour of Gdansk Inhabitants in the Period 1998 - 2002

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*Abstract* – The Gdansk Urban Transport Project – an undertaking sponsored by EBRD and organised by the City of Gdansk – have brought an occasion to provide new edition of comprehensive transport behaviour survey in 2002. The aim of these surveys within the GUTP Programme was to investigate market opportunities in current and foreseeable future of public transport services in Gdansk. A previous such a survey (1998) have brought wide range of data and methodology, this time it has been a case to observe time related phenomena. The survey was conducted in three parts: (i) home interview on overall transport behaviour, (ii) home and on-street interview on transport preferences, (iii) traffic counts on the network. These three surveys allowed to present wide range of information on transport market and provided data for forecasts. The main results of these surveys show that there is a constant mobility in general terms while significant changes are within the structure of this. Due to unemployment the mobility related to work trips have decreased as those related to non-home based trips increased.

## 1. Introduction

The aim of the GUTP is to support the decision of the City of Gdansk in the scope of the organisation and management of public transportation in the City, in the conditions of market and social-economic change, the adaptation of the Polish economy to its accession into the European Union and the current and expected phenomena related to transportation in the City and Region.

Within this work, **Task A** served to prepare information on the existing and potential market for public transportation services and the aspects of the implementation of new service providing possibilities, which have a direct effect on the level of these services.

We have carried out **surveys and analyses**, aiming at the determining of the size and structure of the public transportation market in Gdansk, we have examined the future market development conditions and scenarios, the possibilities to support and affect certain forms of transportation behaviour through system arrangements within the framework of the City's transportation policy.

## 2. Main characteristics of the Public Transport market in Poland and Gdansk

The Public Transport (PT) market in Poland plays an important role in urban areas and has a long tradition over recent decades. As the economic level (and car ownership in result) is relatively low the PT ridership is high and a kind of custom to use and prefer PT is visible. Some major data are shown below.

***The main data on public urban transportation in Poland***

Public transportation in cities	Annual data			
	1990	1995	1999	2000
Population of Poland. in thousands	38 183	38 609	38 654	38 644
Population served by urban transportation. thousand / %	18 778 / 49.2	18 812 / 48.7	18 658 / 48.3	18 404 / 47.6
Number of cities with public transportation services	275	277	267	N/A
Transportation offer:				
Length of lines. in thousand km	44.0	52.6	50.9	49.8
- bus	19.9	25.3	24.9	24.1
- tram	0.92	0.93	0.93	0.93
Rolling stock. in thousands:				
- buses	14.1	12.8	11.9	11.6
- trams	N/A	3.17	3.37	3.36
Seats in vehicles. in thousands:				
- buses	1 608	1 461	1 368	1 320
- trams	N/A	423	442	445
Passenger travel. mln				
- annually	7 264	5 909	4 935	4 954
- daily average	19.9	16.2	13.5	13.6

*Source: 2001 Statistical Yearbook, Main Statistical Office (GUS)*

As shown in the breakdown, following a period of a drop in the transportation offer as well as in its size up to 1995 – there has been a stabilising of the two aspects.

By the end of 90-ties PT organisation was based on so called public (state) owned enterprises. Beginning 1990 these companies have been transferred to local governments (“communalised”) and then converted into two different directions: in some of Cities (Kraków in 1990, Łódź in 1993) into commercial joint stock companies, owned by cities, and in most other (including Gdansk) into budget units: City controlled organisations. In following years those budget organisation have been restructured and converted into commercial companies – nowadays only two big cities (Warsaw and Gdansk) remain with budget type of PT services.

At the same time the market have significantly changed – with the rapid economic changes and economic growth (and car ownership, relatively higher the economic ratios) the PT ridership dropped down during first years of the decade and then stabilised on new level.

Although the overall situation on PT market in Poland looks now stable (depending on the city stable or slowly dropping down) it shows important phenomenon of some differences between particular cities or operators. One can risk a hypothesis that this is related to transport policy in those cities – where it looks more active there are higher PT ridership, where it is passive – it seems lower. For example – in Kraków, a pro-active transportation policy was adopted in 1993, a public transportation

development programme together with financing - in 1996 and these policies are being consistently implemented. The case is similar in Łódź – policy adopted in 1995, the implementation is in progress.

Nevertheless, significant differences between the particular cities, similar in character are visible. From the analysis of the data presented below it clearly follows that Gdansk is characterised by a relatively low level of public transportation usage, despite the relatively low income level (GDP per inhabitant) and low overall mobility<sup>1</sup>.

*A comparison of the economic indicators and the use of public transportation in selected cities*

No.	Item	Unit	Gdansk		Kraków	Łódź	Poznań	Wrocław
1.	Population	persons	460 817		740 465	790 197	590 000	633 887
2.	Area	km <sup>2</sup>	415		397	295	261	293
3.	Budget	M PLN	880		1 328	1 632	1 258	1 250
4.	GDP/person	PLN	24 376		26 330	20 645	32 796	25 285
5.	Number of passengers	M persons	180		332	250	228	246
6.	Overall non-pedestrian mobility of the inhabitants	trips/person/day (year of survey)	1.51 (1998)	1.30 (2002)	1.27 (1994)	1.55 (1995)	N/A	N/A
7.	Share of public transportation in non-pedestrian journeys	%	46.6	54.6	69.6	71.3	N/A	N/A
8.	Transportation work							
	- total	k. km	28 748		60 368	58 869	33 678	42 698
	- trams	k. km	12 313		24 558	30 002	16 385	22 475
	- buses	k. km	16 435		35 810	28 867	17 293	20 223
9.	Transportation work							
	- total	k. km	28 748		60 368	58 869	33 678	42 698
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	- buses	k. km	16 435		35 810	28 867	17 293	20 223
10.	Transportation work ratio							
	- trams	k. km/vehicle.	74,17		74,19	80,65	69,14	70,23
	- buses	k. km/vehicle.	84,72		85,47	88,01	73,90	79,93
11.	Vehicle use ratio							
	- trams	%	73,8		75,4	79,5	73,1	78,6
	- buses	%	86,6		84,9	84,1	80,7	79,8

1 We have omitted the comparison of the car ownership index as a factor influencing the distribution of transportation tasks because there is no reliable source of data on the number of cars in Gdansk, while similar data from other cities cannot be deemed comparable – this situation is due to the method of data collection in the data bases of the vehicle licensing institutions.

## 2. Methodology of surveys

The Methodology of the market surveys was based on the following approach:

- We used the results of the wide-ranging surveys from 1996 – 1998 made by the City of Gdansk in partnership with the Technical University of Gdansk; these surveys allowed us to describe the size and structure of passenger travel and to describe the passenger and vehicle traffic observed on the transportation network;
- We used data describing the City from the point of view of the variables explaining the demand in the transportation services market, which the Gdansk Development Office uses for the purposes of spatial planning. This data includes both the elaboration from the survey period in 1998, the current state, as well as a forecast for the coming years;
- We have carried out inspection surveys of the transportation behaviour of the city's inhabitants in order to check the current state of this behaviour and to assess changes in recent years (expected intuitively due to the changing economic situation), as well as traffic counts on the network (passenger and car flows) in order to compare the external mobility symptoms;
- We have additionally surveyed the inhabitants' stated preferences as to the choice of mode depending on the quality and prices of the services offered and the influence of road traffic organisation factors;
- Against the results of these surveys, counts and analyses, we have prepared traffic and network models for Gdansk and obtained a great deal of detailed information on the characteristics of the market, the links to the spatial development, the economic and social situation, as well as on the influence of these features and the preferences of the inhabitants on their potential behaviour in the future;
- On this basis in turn we have built hypotheses and calculated quantitative parameters as to the changes in the size and the structure of the market for transportation needs for the next 5 years (until 2007). We have also been able to compile forecasts of the use of the individual modes in the coming 5 years and to indicate the areas and lines requiring a new approach to the management of public transportation.

The survey was provided by *Pracownia Badań Społecznych* from Sopot (PBS, Sopot based social research company, Ltd) and a group of traffic counters specially organised by *Biuro Inżynierii Komunikacyjnej* from Gdansk (BIK, transport planning and designing company, Member of the Consortium).

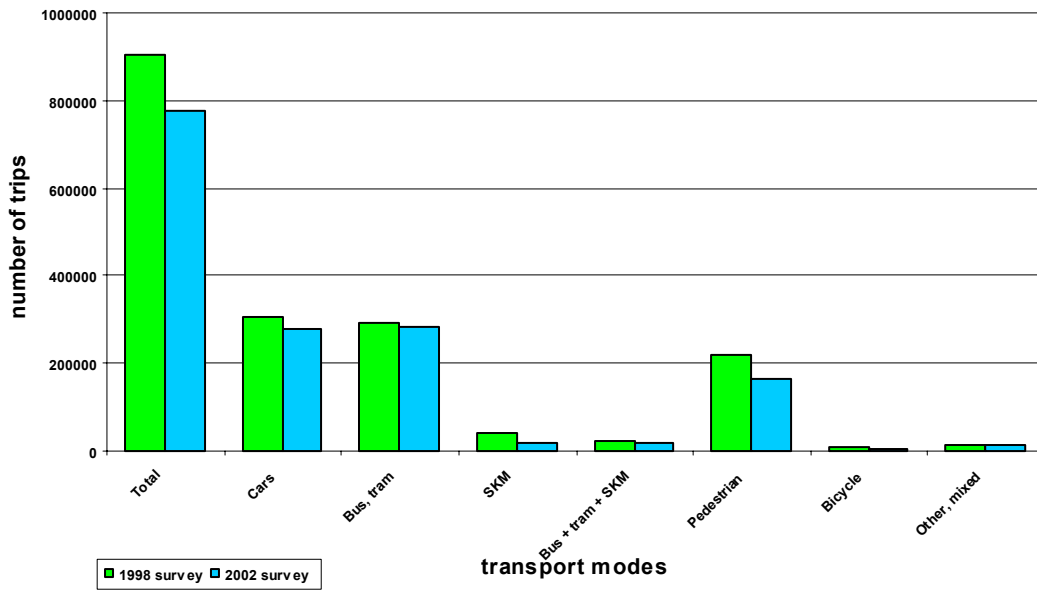
## 3. Main results of the surveys

Such a defined scope of research and analyses allows one to formulate assumptions for the market strategy of the future organisation of public transportation in Gdansk, a strategy which can be used for the activation of public transportation services as a realisation of the City's transportation policy. Simultaneously, these results can be used in the subsequent Project Tasks for the assessment and verification of the individual planned development undertakings.

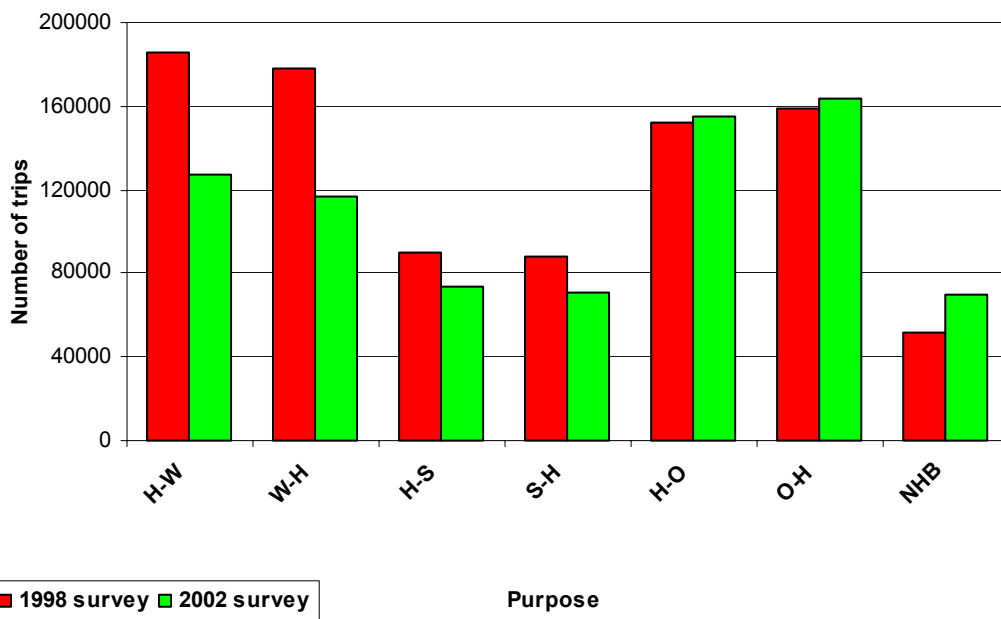
The main results of market research are shown in the following diagrams:

(symbols of trips by purpose: H – home, W – work, S – school, O – other)

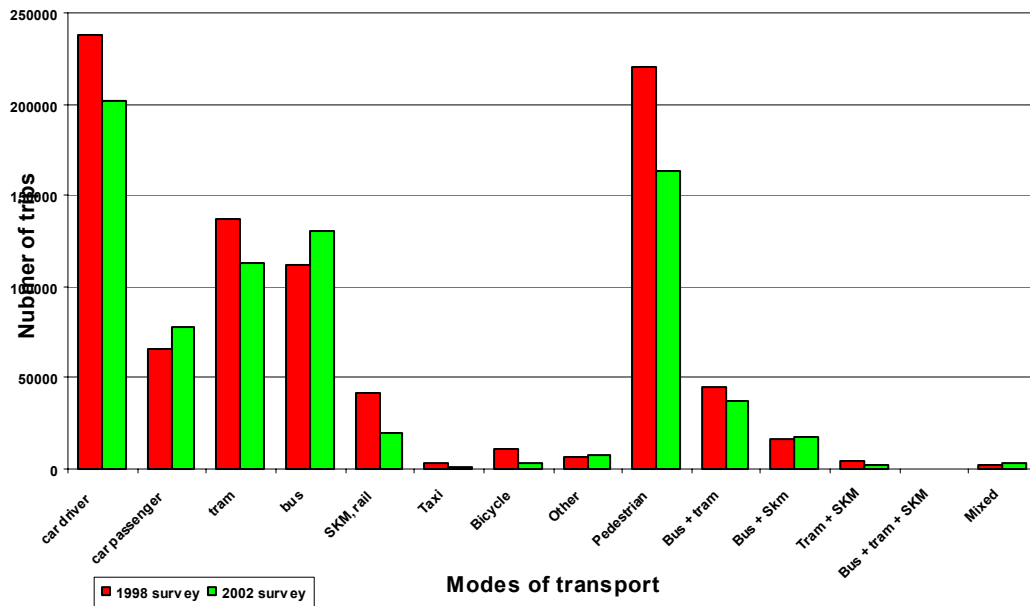
Distribution of all trips of inhabitants of Gdansk by modes of transport for 1998 and 2002



Distribution of all trips of inhabitants of Gdansk by purpose for 1998 and 2002



Distribution of all trips of inhabitants of Gdansk by detailed modes of transport in 1998 and 2002



#### 4. Discussion of main results

The results of these works lead to the following observations as to the market situation and the future prospects for public transportation in Gdansk:

- There is a drop in the overall mobility of the inhabitants (by about 10% in the period between 1998 – 2002), mainly in the commuting to and from work,
- The share of public transportation in overall traffic remains at a similar level of about 40% of total journeys (including pedestrian). There has been a decrease in absolute value (by about 10%),
- We have seen a minor drop in the number and the share of non-motorised trips – from 27% in 1998 to only 23% in 2002. This can be caused by different periods of surveys – in 1998 this way warm May, in 2002 chilly late October; this can also mean the dispersion of housing and land use in consequence decrease of non motorised trips.
- Car journeys have decreased somewhat in number, however, in light of the phenomenon mentioned above their share stays at the same level (around 34% in total number of trips).
- The SP surveys of the inhabitants indicate a certain inclination to switch to public transportation, but under numerous condition – especially pertaining to the quality of the services and the comfort of connections; the cost factor was not emphasised. Simultaneously, a significant number of the inhabitants are ready to accept certain difficulties in car traffic.

On the basis of the experience of numerous cities in Europe and world-wide, assuming a policy of the preferential treatment of public transportation, the implementation of such a policy is possible only after of the following observations as to the behaviour and preferences of the City's inhabitants have been considered:

1. the surveys showed that there is a readiness on the part of the inhabitants to increase their interest in travelling by public transportation on condition that its functionality is improved;
2. furthermore, the inhabitants primarily accept the limiting of car use in travel to the city centre, and to a lesser extent – the concentration of services in large-size shopping and service centres;
3. some instruments of preferences for public transportation can be used in Gdansk in order to raise the attractiveness of these services; this applies especially to Wrzeszcz and the City Centre, but also to many other smaller areas of traffic concentration,
4. the City needs a careful urban development policy – we can see the effects of the excessive dispersal of development, which will hinder the concentration of public transportation services.

As regards the influence on the situation of the municipal operator (currently ZKM, another entity in the future, certainly commercial in approach) the following observed phenomena should be considered:

- (i) there is some flexibility in the demand for public transportation services – price is an important factor in the choice of mode, but also the service offered is considered (its standard and reliability);
- (ii) it is therefore necessary to improve the functionality of public transportation services and to promote them intensively in order to win passengers as customers, this can be done in conjunction with a careful raise in the tariffs;
- (iii) simultaneously The City should introduce effective instruments of preferences for public transportation vehicles in order to raise the attractiveness of their services,
- (iv) these efforts should in turn be implemented in conjunction with the introduction of certain restrictions on private car use, especially as regards access to the most attractive parts of the city from the transportation point of view (the City Centre, Wrzeszcz).

From among the other observations noted by the Consultant during the works, the following are worth mentioning:

- (v) The results of the analytical works (including modelling) are biased by the uncertainty of statistical data available in the official sources of the City Office and state institutions. This is due on the one hand to the lack of specialist data bases concerning transportation issues, but also is related to numerous administrative changes and changes in the geographic points of reference. It is vital for the City to create such a system of information on its territory that would allow the collection, processing and checking as well as the storage of the basic information on the City independent of these changes.
- (vi) We have consolidated the system of measuring points (car traffic loads and passenger traffic flows) according to the scope prepared for the 1998 surveys. It is necessary to aim at the standardisation of the observation methods and the gradual automatization of the counts.
- (vii) The most important deficit in the traffic flow observations on the public transportation network is data on the traffic on individual lines. The scope of the present series of surveys did not allow such detailed measurements. Therefore, in our research we have adopted a survey – modelling method. In the future, however, the operator should develop a system of a detailed observation of the mobility of its customers.

## 5. Conclusions

The results obtained allow us to outline the possible actions needed in order to achieve the goals of the GUTP – to improve public transport services as one of basic public functions.

- (1) Research shows that Gdansk has a market for development in terms of public transportation – a difficult market, due to the already established “pro – car” attitudes in spite of the City’s relatively weak economic situation.
- (2) The most important is the relatively (compared to other cities in Poland) low level of public transportation use. This probably results from the currently fairly good road traffic conditions, the shape of the City’s transportation network (a single axis along the coast and relatively short perpendicular access routes). Basically, the only significant place where traffic is impeded is the very city centre (the area of the PKP Main Railroad Station) and the central part of Wrzeszcz. This observation is important insofar as, as shown in the information on the tariffs used in Polish municipal enterprises collected within the framework of Project, the tariff in Gdansk is among the lowest. Therefore the low level of usage is not due to a price barrier. In fact, the surveys did not indicate this reason, indicating rather the quality of the service and its matching to the passengers’ expectations.
- (3) A significant observation stemming from the surveys is the drop in the mobility of the inhabitants, caused mainly by rising unemployment. Although this drop has not yet caused a decrease in the number of travels per day (there is a certain drop during peak hours, since commuting to and from work is dominant here, which can lead to a decrease in rolling stock needs stemming from peak hour demand).
- (4) There are still many reserves among the instruments of passenger increase used in Gdansk. The surveys clearly indicate the priority of service quality. They also show the inhabitants’ readiness to accept certain limitations in car traffic, which could result in an improvement of service conditions in public transportation. Furthermore, a significant number of passengers prefer direct connections without transfers. This would support the development of the bus system and does not persuade one to expect a rise in traffic due to the co-ordination of the operation of different modes (e.g. with SKM). This thesis must be subject to detailed observation during the further reorganisation of the system.

In general terms there is possible margin for the future market changes (related to the services and other influencing factors). The above observations lead us to the following conclusions as to the needs and development possibilities for the public transportation services market in Gdansk:

- A further rise in car use (although less dynamic than during 1990 – 1998) will probably draw passengers away from public transportation. However, it is young people who should be the most important customers of public transportation, because, as a comparison between 1998 – 2002 showed, they do not significantly cross over to individual transportation, and they are also a large customer group.
- The second group of journeys which are a source of opportunity are connections with the central areas – Downtown and Wrzeszcz. These areas can become a significant market for services, and more importantly – the concentration of passenger flows in public transportation means the diminishing of car traffic flows in the city, which would certainly be desirable from the point of view of the efficiency of the road network and the reduction of its negative effect on the environment.



- The city's spatial development policy requires serious analysis. We can see a dispersion of development which results in pressure on road traffic and a lack of the possibility for the concentration (and thus the economisation) of public transportation traffic.