Labour Mobility, Beneficiaries of Public Transport Services in Eastern Europe and Central Asia

FINAL REPORT

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Executive Summary

The legacy of communism: an inefficient urban form
In a number of important aspects, the urban form of ECA cities is rather different from that of West European cities. The spatial distribution of functions like living and working is the result of the communist regimes, which, in the absence of markets for land use, often planned those functions far from each other. This resulted in the need for long home-to-work trips, which were served by cheap and dependable public transport.

Slow changes in the urban form ...
Urban form takes a long time to change, and with the exception of a few cities where dynamic land (real estate) markets developed quickly, many still have a spatial distribution that will take at least a couple of decades more to adapt to market conditions. This means that the transport system still has to meet the demand for relatively long commuting trips, including those of poor workers.

... and much more rapid changes in the urban passenger transport system
But the urban transport system itself is changing rapidly. The fast growth of car ownership and use is leading to an erosion of the market of public transport, in much the same way as it did in Western Europe starting in the 1960s and in North America from the 1930s onward. The financial problems of public transport systems in ECA cities are increasing steadily and the quality is going down as a result. Those who are captive of public transport, and this includes most of the poor workers, are being increasingly less well served.

Poor workers depend on public transport
Many poor workers in many ECA cities need to make long work trips and depend on the deteriorating public transport system to have access to their jobs. This was confirmed by two small pilot household travel surveys, held in the Bulgarian capital Sofia and the Rumanian capital Bucharest, as part of the present study. These also showed that a number of poor workers spend large shares of their income on their work trip. The danger is that for some people the trip to work becomes so expensive that it is no longer worthwhile to do the job.

The present study
The study looked at possible ways in which the problems experienced by the poorer parts of the urban population concerning their work trips might be solved. Apart from the two cities mentioned, the study also looked at the situation in the Ukrainian capital Kiev and at three cities in the Russian Federation, Cheboksary, Chelyabinsk and Khabarovsk.
Further conclusions

Further conclusions are:

1. The concessionary fare system, operated in all ECA cities studied, appears to be badly targeted to the needs of poor workers. They have much less access to these privileges or preferences (as they are variously called) then the non-working poor. This was found in the surveys in Bucharest and Sofia, but it is probably true for many other cities as well. It means that a better targeting would open the possibility to raise the general fare level in an effort to increase the fare box cost recovery, without unduly increasing the difficulties for the poor workers to have access to their jobs. The same holds true for a change in the fare structure, e.g. by the introduction of a distance based fare instead of the traditionally used flat fare.

2. The introduction of well-defined Public Service Obligations, as is happening in the ECA countries that now have joined the European Union, with the obligation on the side of the authorities to pay the associated compensations, will make the situation clearer for the authorities as well as the operators. However, only if the authorities make more public funds available will this lead to improvements in the public transport supply. And an increase of public funding from the general taxes, to maintain the level of service, is not very likely in most or perhaps all cases.

3. Regarding the concessionary fare systems, apart from better targeting, there is also scope for improvements in the way they are operated. Technically sophisticated systems are perhaps not effective under the prevalent conditions in many ECA cities. But the introduction of a simple coupon system may provide a fair distribution of the compensations over the operators, and offer the possibility to include part of the minibus operators who normally do not honour concessionary fares (those who cover areas not, or no longer, covered by the traditional public transport). It may also limit the inefficient use of the ride-at-will fare concessions found in some of the cities studied.

4. Two examples from EU countries were studied for their potential to provide a stable funding, independent of the general taxes, for maintaining the level of service of public transport that would also, but not exclusively, benefit the poor workers:
   - In French urban areas a “transport tax” system (Versement Transport) is levied, in which employers pay a tax on the salaries of their employees, which is earmarked for improvements or compensation payments for public transport. Small firms and those who provide their own transport to their employees are exempt.
   - The German excise tax on car fuel includes a part, which is earmarked for improvements by local authorities of their public transport and local road networks.

Based on simple estimates for Sofia, it seems that both systems lead to tax increases which are probably not politically acceptable, especially the fuel tax (as the number of cars is still relatively limited).

5. An example from Brazil, the “Vale Transporte”, was also considered. This is a system of coupons that employers offer to their employees and which can be traded for public transport tickets. The employers make a reduction on the salary of the employees who use the opportunity, and this works in such a way that it is only attractive for poor workers. It makes the system well targeted towards them. But has an important disadvantage in common with the French “transport tax”,
namely that it makes employment more expensive, even if it seems to tax employment to a lesser degree than the French system.

6. Another way to improve the availability of public transport services in the face of limited budgets is through cost reductions, of course. Many studies indicate that the introduction of competition “for the market” can lead to cost reductions. But as this study looks essentially to the demand side of the market, interventions on the supply like this were not explored here. Nevertheless, an important lesson from the West European experience with public transport subsidies is that it easily leads to a loss of cost control and financial discipline. In a situation where subsidies or PSO compensations remain necessary, introducing competition is the complimentary measure that can keep the pressure on cost control and financial discipline, not only on the operators but also on the authorities.

Household travel surveys provide other insights than other surveys
The two household travel surveys, although they were small pilots, were held for the first time in Sofia and Bucharest. And they are still very rare in other ECA cities as well. They should be seen as complementary to other surveys (“choice based” on board travel surveys as well as household expenditure surveys), as they provide insights that cannot be obtained otherwise. The question of the influence of the urban form of ECA cities on the travel needs of workers (but also of other people) merits to be explored further. To that end future household travel surveys should be organised in such a way that the data can be coupled to a detailed network, allowing a more detailed spatial analysis of the trips.

The lessons form urban planning and from transport planning
Different professions are studying the transitions in ECA cities with different interests. There is a marked contrast between on the one hand the urban planners, who study the dynamics of urban form in ECA cities and take the provision of UPT for granted, and on the other hand the transport planners, who study the provision of UPT and its many problems and take the urban form and its resulting travel patterns for granted. The World Bank is involved in both types of work. It is therefore recommended that Urban Planning and Transport Planning research in the ECA region should be brought together in studies in which the interaction between the urban system and the transport system are studied.

The need for exchange of experience
Professionals involved in public transport in the ECA countries (university researchers, consultants, operators and city staff) are eager to learn and to exchange experience. The opportunities for this, however, are much less developed than they are in Western Europe. In Western Europe, capacity is accumulated in research institutes, universities and consultants, and channelled through a large variation of international organisations and programmes. In ECA countries and cities the required knowledge and experience is generally inadequate and access to available evidence is difficult. It is therefore recommended that more platforms for the exchange of experience between ECA countries and cities be created and that the exchange of experience include the dissemination of the experience with household travel surveys.

The wider context of World Bank activities
The low-income urban population form a specific problem in a wider context of urban transport policy. This wider context is addressed in the World Bank’s comprehensive
strategy for addressing urban transport matters in the ECA region. This strategy articulates a broad set of principles that will help countries in addressing their urban transport policy agendas and investment priorities, and also serves as a basis for guiding the Bank in providing assistance to these countries.
1 Introduction, background and objective

1.1 Introduction

This report summarises the study findings of “Labour Mobility, Beneficiaries of Public Transport Services in Eastern Europe and Central Asia”, carried out in 2003-2004 by ECORYS and NEA Transport Research and Training, in the framework of the Netherlands Trust Fund Transport and Infrastructure TF-050195.

1.2 Background

In most socialist economies, Public Transport (PT) was traditionally viewed as a basic social service. This philosophy emphasized mobility as a merit good, a social imperative to be provided to all through a complete and integrated PT network. The traditional system would also offer extensive fare reductions or exemptions for certain groups.

In order to maintain a basic social PT network high levels of operating subsidy as well as state contributions to finance capital may be needed. These subsidies are under pressure, which could lead to reducing levels of services provided in order to save costs. The most unprofitable services will probably be dropped first, resulting in a reduction of both accessibility and affordability.

In Western European countries from the mid 1960s onwards, PT patronage started to decline and the need for subsidies to increase, due to increasing car ownership and decreasing level of service. The latter was a result of increasing operating costs (see also Annex B – Working Paper 8 “Trends in Transport”).

In most of the ECA countries, a serious decline in PT usage has been seen during the last decade. This is illustrated in the next figure for Bulgaria, Romania and Ukraine (see also Annex B - Working Paper 6 “Secondary data”).
Figure 1.1 Development of overall PT patronage (annual number of passengers per capita) in Bulgaria, Romania and Ukraine. Source: National Statistical institutes, edited by ECORYS
The recent decline in PT patronage, combined with the inability and unwillingness of state and local governments to continue paying subsidies at levels prevalent in the past years, puts the PT operators in the ECA countries under pressure to increase cost recovery and/or to cut services.

**Wider context: Urban Public Transport (UPT) reform in ECA**

When looking at the possibilities for increasing cost recovery, both the supply and the demand side should be considered.

On the supply side, costs can be reduced by introducing regulated competition between suppliers and by allowing private enterprise to enter the market. There is already a number of studies that describe the way in which this can be done, and a number of reforms have started to be introduced in ECA countries, although not yet at a large scale.

These reforms include a range of issues, including: restructuring of the institutional framework, clear separation of planning and operational functions, restructuring the financing mechanisms and incentives within the sector and altering the basis for tariffs and concessionary fares.1

The World Bank experience and strategy for UT in ECA (December 2002)2 has five pillars (i) policy priorities; (ii) institution building; (iii) investment options; (iv) knowledge-related activities and (v) partnerships and linkages. One of the issues raised in this strategy is the need to simplify and otherwise improve fare structures, and overhaul the fare/subsidy policy to improve targeting. This is critical in cities with numerous and category-based fare exemptions, ill matched with capacity to pay compensation, and with weak efforts regarding inspection and fining.

However, much less is known about the demand side of PT in the ECA countries. What would be the effect of changes in the fare structures and levels, particularly on the large part of the patronage that are captive riders? What will be the effect on the poor? And, as PT is for many the most important way to access jobs, what is the effect on the labour mobility?

1.3 Objective

The Terms of Reference give the following study objective:

“The overall objective of the study is to produce a framework for the Bank and key policy makers in ECA countries in trying to address the problems of their low income urban populations as regards the access to and prices of Public Transport services and possible solutions.”

Based on the above objective, this study will:

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1 See e.g. Advancing Urban Passenger Transport Reform in the Europe and Central Asia Region – Reform Options Report, November 2003, produced for the World Bank by CIE Consult
2 Urban Transport in the Europe and Central Asia Region: World Bank experience and strategy, December 2002
“identify poverty-targeted PT interventions that would provide the right incentives to the public authorities and the urban public transport operators to serve the poor. In doing that, the study focuses on the impacts on demand for PT services, especially for work trips by the poorer parts of the urban population.

A warning should be given to the reader here. In the context of these Terms of Reference, the term “labour mobility” refers to the daily mobility of workers between their homes and their jobs. The term is also used frequently to indicate the dynamics in the labour market, i.e. the mobility of workers to move between jobs. In this study, the term exclusively refers to the former notion, also described in literature as “home-to-work travel”, “work travel” or “commuting”.

1.4 Structure of this report

This report is structured to include the following chapters:

- Chapter 2: Methodology and approach
- Chapter 3: Household mobility surveys
- Chapter 4: Secondary data
- Chapter 5: Measures and scenarios
- Chapter 6: The wider context
- Chapter 7: Conclusions and recommendations

In Annex A the Terms of Reference are presented.

Annex B contains the eight Working Papers produced during the study. The main conclusions of these Working Papers are reflected in the main report. The Working Papers are:

- WP 1: Overview of the problem
- WP 2: Household survey methodology and questionnaire
- WP 3: Discussion topics for Household survey and questionnaire
- WP 4: Survey strategy
- WP 5: Household surveys
- WP 6: Secondary data
- WP 7: Experiences from the European Union
- WP 8: Trends in transport

The Household Survey Questionnaire used in the study is annexed in Annex C.
2 Methodology and approach

2.1 Introduction

This chapter provides the overall methodology and approach of the study. One of the key elements in the methodology is the analysis of mobility patterns and its determinants. Such an analysis requires reliable data on mobility in ECA cities. It is well known that cities in ECA countries generally suffer from a shortage of information about urban and sub-urban populations concerning their travel needs, their travel practices and the way these change over time, the principal determinants of travel behaviour and the use of different transport modes. This lack of information contrasts with the large amount of knowledge on the living conditions of households, consumption budgets, demography and health practices gained through (National) Household Expenditures Surveys.

In the traditional market economies, including Western Europe, data on PT include both data on the supply and the demand. The demand data are based on passenger counts, performed in many ways, data from ticket sales and survey data. The survey data consist of on-board interviews (including interviews in stations and at stops) on the one hand, and household travel surveys on the other. All data sources have their particular strengths and weaknesses, and they complement each other in providing the insights on which PT policies can be soundly founded.

The instruments of supply data, ticket sales data and passenger counts are well known in ECA countries, but the application of surveys is still relatively rare. On-board surveys (also called “choice based surveys”) have the advantage that it is cost-effective to reach the respondents who make PT trips, as they are interviewed while making the very trip. It is difficult, however, to derive insights in the full mobility patterns of the respondents, and of the role PT plays for them relative to other modes. Household travel survey data however, while being more costly to collect, allow the analyst to get a view of the full mobility patterns of the respondents, as the interdependencies between the trips of a person, between the various modes used, and even between the different members of the same household can be discovered.

As there seemed to be no household travel survey data available, two small-scale trial household travel surveys were organised as part of the study. Thus, the approach was to use two types of data sources:

(i) to organise and exploit the two small-scale household travel surveys mentioned, conducted in Sofia and Bucharest, and

(ii) to use existing (secondary) data from four selected countries: Bulgaria, Romania, Ukraine and the Russian Federation.
The countries were selected based on demographic features and distribution and density of the population, GDP per capita and poverty level, rate of unemployment, affordability of public transport fares.

The Household surveys (net sample size 500 households each) were done by the Institute of Transport and Communications (ITC) in Sofia and SEARCH Corporation in Bucharest. The secondary data (time series) were collected for Bulgaria, Romania and Ukraine and, where available, for the cities of Sofia, Bucharest and Kiev separately. In Ukraine, the Kiev Institute for Sociology (KIIS) collected the information. Existing data from UPT surveys in three cities of the Russian Federation were used, collected by ECORYS-NEI within the framework of the Public Expenditure Review (PER) in Public Transport and Road Infrastructure Sectors, initiated by the RF Ministry of Finance (MoF) in 2002.

2.2 Key determinants of mobility

An important outcome of the study is the estimated impact of UPT policies on mobility of the low-income people. Both the Household Survey and the secondary data serve as input for the definition of different UPT policy measures to be assessed on their impact (see Chapter 5). Such an analysis cannot be conducted without describing the relationship between the main determinants (accessibility, availability and affordability) of mobility for the lower-income target group.

Role of PT for the poor

In understanding the role of PT for the poor, the starting point is the linkages between poverty and transport in general. In order to achieve poverty reduction, the accessibility of poor people to basic economic and social activities needs to be improved. The access to social activities includes those to social services, such as education and health. This type of access is not the focus of the study. Instead, the study focuses on improving access to economic activities for the poor, more specifically improving access to labour.

Through improving access to labour the poor will be able to enlarge their radius of action leading to a bigger choice of job opportunities.

Relationship between the labour, housing, and transport markets

There is a strong relationship between the work travel market, the labour market and the housing market. Every worker makes choices in these three markets. If someone is looking for a job on the labour market, one of the considerations is if he (or she) can easily reach that job from his (or her) home on a daily basis. In that case he makes a simultaneous choice in the transport market as well as in the job market. If the job is too far from his home, he may consider moving house, which means a choice in the housing market. Both the labour and the housing markets are relatively inflexible markets. The costs (in all senses) of changing job or changing house are often high, so a threshold has to be crossed before a change is made. Changes in the travel market, however, are much more easy to make. It is work travel that allows a change in either the job market or the housing market to be made, without causing an immediate need for change in the other.
Work travel, however, also has its limitations. And especially for poor workers, the cost of the work trip (often the PT fare) may make a certain job difficult to reach from the existing home. A higher income or a lower fare will increase the radius in which a job seeker can afford to look.

In market economies, the urban structure and from, i.e. the locations of homes and jobs and the distance between them, is to a large degree the result of the land market (real estate market), where economic and other activities as well as housing are competing for space. The patterns that result from this and their dynamics are well described in literature. The transport system plays an important role in this, having an influence on the urban shape as well as being shaped by it.

In the former command economies of the ECA countries however, these dynamics did not exist. The regimes inherited urban structures that were shaped by market forces, but gradually changed these, often by adding large panel housing estates, and large sites for heavy industry, with PT services between them that were offered at low fares, with no consideration for the costs of this supply. The spatial structure of a city can only change slowly, and the urban structure of most ECA cities still reflects this style of urban planning.

An example of a relatively fast adaptation is the city of Prague, where the strong commercial development of the historic centre has resulted in the departure of most of the residents, where the ring of housing around it (dating from the 19th century to WW II) are the subject of gentrification, and where the large panel housing estates at the periphery of the city are increasingly housing the less wealthy inhabitants. In cities where the economic transition is slower, the urban structure inherited form the communist times will remain much longer. The city of Sofia is a clear example. A study commissioned by the World Bank and the UN ECE indicates that for a capital city, Sofia has a relatively high share of poor population. Its urban shape is characterised by large panel housing estates with very high densities, situated at the very periphery of the city, and large industrial sites that are situated much closer to the city centre. The city centre is only very slowly developing into a central business district (CBD); in 2000 only 18% of work trips had the city centre as its destination. This means that the role of affordable PT is very important in helping the city to function economically in an inefficient urban shape.

Affordability of public transport and social exclusion

In terms of affordability it is well known that a higher budget buys a bigger radius of action, and therefore a bigger choice of opportunities for activities that better satisfy the needs of the economic subject. One of the key notions should be the geographical range in which a person is able to move to satisfy his needs. The smaller this range, the lower the probability for this person to increase his welfare. He (or she) may still spend the same percentage of income, but he can only afford slower modes and therefore get less far. Many poor people do not have much time available, because it costs them a lot of time to fulfil their basic needs. In fact, when wealth increases, people buy time by buying

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time saving devices, including faster transport. These budget notions serve to illustrate how people who fall into poverty face a world getting smaller and a decrease of variety of opportunities: same amount of trips, same percentage of money and time budget, but a smaller range of action. This mechanism can lead to social exclusion.

In general a smaller radius of action means a smaller choice of opportunities for activities. For those ECA cities that have, like Sofia, a very dispersed pattern of opportunities, this is particularly relevant. However, there is one important phenomenon in the ECA countries that works in the opposite direction, namely the elaborate system of concessionary fares (sometimes called “preferential fares” or "privileges") for the use of PT at a reduced fare or free of charge. This is for certain (politically decided) categories of people, who can be distinguished in two broad groups, those with merit and those in need. Both categories, and the latter in particular, include poor people, but not all poor.

*Travel behaviour of the poor in light of affordability and supply of PT*

There is a direct link between the cost of travelling to work and the salary the worker can earn on that job. Obviously, if the travel costs rise, at some point it is no longer worthwhile to do the job. It is difficult to establish where this point lies, as there are clearly subjective judgements involved. The household travel survey should provide indications for the answer.

For the city policy makers it is important to understand that fare increases may mean that PT will cease to bridge the gap between the badly co-ordinated housing and job locations, that are the legacy of communism. This may damage the economic and social development of the city.

### 2.3 Other tasks performed

The household surveys and the secondary data form the core of the study; these feed into the formulation of measures and scenarios for future UPT policies. The scenarios are intended to illustrate the effectiveness of different possible PT policies and the effect for the identified (poor) target groups.

Another input for the measures and scenarios is the comparison with EU experience. The aim of this desk survey of literature is to identify principles and practical approaches used in other countries and cities, that can serve as examples for defining pricing and subsidy policies for PT services in ECA cities, with low incomes in mind.

Originally, the intention was to organise dissemination of the findings of the study in a number of workshops. Although this is still the intention, the plans of the World Bank have changed in the course of the study. The exact form of the dissemination remains to be decided by the World Bank. One workshop did take place, however, in which the local experts involved in the data collection in Bulgaria, Romania and Ukraine participated in a session that aimed to arrive at a synthesis of the data collected.
3 Household mobility surveys

3.1 Introduction

The aim of the household mobility surveys is to provide a data source for statistical analysis of urban PT and its determinants with special focus on low-income workers, while taking into account as much as possible non-work mobility of all members of the selected households. Consequently, the sample will only contain households with at least one worker, but the non-working members of those households will also be interviewed. In this way, the interaction between all household members will be surveyed. But the most important target group for “poverty”, i.e. households without any working member, will not be included in the study.

Contrary to household expenditure surveys, household travel surveys are still very rare in ECA cities. In fact, in the two cities where the surveys were held, it was to our knowledge the first time it happened. The scope of a household travel survey differs from that of a household expenditure survey, of course. The expenditure on travel is recorded in both cases, but in the latter case this is put into the perspective of spending on the other items of the consumption pattern of the household, whereas in former case the travel pattern can be recorded in much more detail (origin and destination of the trips, frequency, distance, duration and speed, modes of modes used). The difference in the way the expenditure is asked, can often lead to differences in results (it is well known that the answers to a survey can vary with the way the questions are asked). We felt it to be worthwhile, on the occasion of this study, to start collecting experience with household travel surveys in ECA cities. The surveys should be considered as a pilot exercise.

The above indicates one of the logical translations of the purpose of the survey into more practical aspects to be included in the survey methodology. In fact, the household survey needed extensive preparation in the following areas:

- **Methodology.** This should reflect the translation of the aim of the survey into determinants (variables) to be incorporated in the questionnaire. The result is the survey questionnaire. Besides the questionnaire, another important aspect is the methodology for sample selection and for data collection. Perhaps the most important characteristic of the survey is the use of a trip diary, in which all trips made during one day by each respondent were recorded.

- **Organisation.** Each survey should take into account the circumstances, notably social and cultural factors, which influence the respondent’s willingness to respond and his or her ability to understand the questions and the purpose of the survey. Local experience was used in drafting the questionnaire, but as there was no previous experience with household travel surveys, so the design of the questionnaire drew heavily on West European experience.
These issues are in detail described in Annex B – Working Paper 4 “Survey Strategy and Tactics”. The survey questionnaire is presented in Annex C. Consultants have worked closely together with local subcontractors: the Institute for Transport and Communication (ITC) in Sofia and the SEARCH Corporation in co-operation with the company Adest Consult as a subcontractor in Bucharest.

It should be noted that in this chapter “PT” (public transport) stands for the traditional forms of urban public transport only, i.e. the metro, trams, trolleybuses and full size diesel buses. The minibuses, which also form elaborate networks in both cities, which have fares about two times the level of traditional PT, and on which the preferential passes are not valid, are not included in this definition of PT, even if they strictly speaking are part of urban public transport. Railway trains are also excluded from the definition of “PT”, because neither in Bucharest nor in Sofia are there train services that fulfil an urban function.

3.2 Methodology and Organisation

This section provides a short summary on the most important methodological and organisational aspects of the study.

Methodology: structure of the interviews and sampling

The survey consists of three parts:

A. General questions for the household, to be answered by the head of the household or the other person most willing and capable to do this

B. Personal questions for each household member over 12 years old, to be answered by that person (the cut-off age is probably 12, but this should reflect the age at which the children start making trips without the guidance of their parents for well defined purposes; as this is determined by cultural and social habits, advice from the local experts is needed)

C. A trip diary for the day of the interview or the previous day (but always a working day) for each jobholder in the household; recording all trips by that person, not just the home-to-work and work-to-home trip.

The questionnaire is provided in Annex C.

In compliance with the Terms of Reference, the sample size in each city was 500 successful household interviews. These were split in two sub-samples, 250 selected randomly throughout the city and 250 in areas with many poor inhabitants. In both cities, the lower-income areas were identified on the basis of the housing values, known from the real estate tax statistics.

Organisation

The surveys, which had to obtain answers from several household members, would have been too complicated for a full send-out-and-mail-back approach. Therefore the interviews were conducted face-to-face by interviewers. The interviews were held in the evenings of Monday to Friday and in the daytime on Saturdays. This ensured sufficient
household members were present during the interviews. The trips recorded in the trip diary were for the same day (on Saturday for the day before), avoiding the problem of memory bias.

The surveys were held from 10 – 29 November 2003 in Sofia and from 17 – 26 November 2003 in Bucharest.

3.3 Quality of the data

The analysis of the results allows a judgement of the quality of the data. Where possible, a comparison with the general statistics for each city was made. But as there are no previous travel surveys with trip diaries (on a household basis or otherwise), the possibilities for such a comparison are limited. Some characteristics of the travel patterns that were recorded, are clearly different from what consultants would expect for West European or North American cities.

There is a number of possible explanations for this:

- The samples, two times 250 households in each city, are relatively small, as soon as stratification (e.g. in income classes) is made.
- There was no previous local experience with household travel surveys and trip diaries, and some problems which occurred during the fieldwork were reported. It is even possible that other problems were encountered that were not reported. This may have introduced some biases in the results.
- As discussed in section 2.2, the spatial urban form of the cities, and consequently the travel patterns resulting from it, are very different from what is found in cities that have grown under the conditions of a functioning land market. Both Sofia and Bucharest appear to be adapting very slowly to market conditions in this respect. Many travel patterns are still the result of urban planning decisions from the command economy period, like the location of the large panel housing estates on the very periphery of the cities, which should explain the relatively long work trips and the long distances travelled by poor people. Some results, which may run counter to the intuition of West European analysts, may in fact reflect what is happening in reality. So we should be careful to dismiss those.

Unfortunately, we were not able to explore the latter possibility further, as it was not possible to make a network-based analysis of the material, which would have allowed exploring the spatial dimension of the travel patterns more fully.

There are two observations regarding the trip diary (part C of the questionnaire):

- **Distance of each trip in km.** In Bucharest, the answers showed that it is very difficult for the respondents to give a reliable estimation. Therefore the origin and destination zones were used to make an estimate of the trip distances. In Sofia, part of the answers were deemed unreliable and estimated in the same way, whereas for others the distance given by the respondent was used. Car drivers seemed to provide the most reliable answers. For the calculation of the distances between the zone pairs a route finding programme was used.
• **Cost of each trip.** When single trip tickets are used in public transport, the estimation of the costs per trip is not difficult for the respondent. But in the case of season tickets (passes), the answers were less reliable. Therefore the costs for such trips were calculated on the basis of the existing fare level and fare structure. The price of the season ticket (pass) was divided by the estimated number of trips made on the season ticket (pass) leading to an estimated single trip price.

• **Duration of each trip.** The travel times given by the respondents did not have the same definition in both cities. In Bucharest, the trip durations include the walking time to and from PT stops, if PT is used. In Sofia, they are in-vehicle times only.

### 3.4 Survey analysis

The survey analysis has been conducted using two approaches. First of all the local subcontractors ITC (Sofia) and SEARCH (Bucharest) have made a number of cross tabulations, which have formed the basis for comparison. Secondly the preliminary results have been discussed during a workshop held in Bucharest on 20-21 January 2004. In the workshop additional analysis on the data has also been conducted.

*Income distributions and motorization rate*

As mentioned the sample volume for both cities was 500, 50% conducted in the poorest areas and the other 50% conducted at random. The poor areas have been defined using two criteria, distance to the city centre and the estimated price of land and buildings (based on taxation). The income distributions of the surveys for all household members is as follows:

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Share [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bucharest</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>58%</td>
</tr>
<tr>
<td>M</td>
<td>28%</td>
</tr>
<tr>
<td>H</td>
<td>14%</td>
</tr>
<tr>
<td>Sofia</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>53%</td>
</tr>
<tr>
<td>M</td>
<td>26%</td>
</tr>
<tr>
<td>H</td>
<td>21%</td>
</tr>
</tbody>
</table>

Note: The group without income is included in the group of low incomes (L). These represent children and scholars below 18 years age, part of the non-working students, housekeepers and long period-unemployed people who are all members of a household with at least one worker.

The table shows that the low-income group is, according to the plan, indeed over represented in the survey.
The observed car ownership of all household members together is another indication of the over representation of the poorer households. For Bucharest the average motorization rate calculated based on the survey results is 165 per 1000 persons, which is clearly lower than the official figure for Bucharest in 2001 of 315 (see section 4.2). In Sofia, the same observation is made; the survey average is 229, much lower than the official figure of 415 in 2001 (see section 4.2). There are in fact two explanations for this: i) in the official statistics the number of company/governmental authority cars is included and ii) the households surveyed do indeed have lower incomes.

**Income related to trip time, costs and distance**

In the following table the average trip time, costs and distance for all workers for all trips made is presented, distinguished into income levels.

<table>
<thead>
<tr>
<th>Table 3.2</th>
<th>All workers, all trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Income Level</td>
</tr>
<tr>
<td></td>
<td>Low, Medium, High</td>
</tr>
<tr>
<td><strong>Bucharest</strong></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td><strong>Sofia</strong></td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>H</td>
</tr>
</tbody>
</table>

The conclusions that can be drawn from this table are somewhat different per city. The trip lengths (“D/trip”), between 5 and 7 km on average for all trips, are very high compared to what would be expected in Western Europe for cities of this size. And Sofia, which is the smaller of the two cities, has the higher average distance. Moreover, from the same column, we cannot conclude that the action radius (the average distance per trip) increases with income, on the contrary. This is probably an effect of the low income housing at the periphery of the cities, where there are not many opportunities in the vicinity. This perhaps also explains why the trip lengths in Bucharest do not increase with income.

However, the cost per trip (“C/trip”) are clearly increasing with income, indicating a shift to more expensive modes.

In the next table the focus will be on work trips only.
The results for the work trips for both cities show that people in the low-income class make shorter, slower and cheaper trips than those in the high-income class, although some of the variations with income are more pronounced than others.

### Preferential pass related to trip time, costs and distance

The following table presents the results split up between the workers who own a preferential pass, and those who do not.

<table>
<thead>
<tr>
<th>Preferential pass</th>
<th>Income Low, Medium, High</th>
<th>Trips #</th>
<th>Time min</th>
<th>T/trip Min</th>
<th>Distance Km</th>
<th>D/trip km</th>
<th>Cost 1000ROL or BGN</th>
<th>C/trip ROL or BGN</th>
<th>Km/Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bucharest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>L</td>
<td>849</td>
<td>24,755</td>
<td>29.2</td>
<td>5029</td>
<td>5.9</td>
<td>4674</td>
<td>5,505</td>
<td>14.6</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>761</td>
<td>21,589</td>
<td>28.4</td>
<td>4016</td>
<td>5.3</td>
<td>4377</td>
<td>5,751</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>398</td>
<td>12,442</td>
<td>31.3</td>
<td>2382</td>
<td>6.0</td>
<td>3906</td>
<td>9,815</td>
<td>13.8</td>
</tr>
<tr>
<td></td>
<td>Total trips without pass</td>
<td>2,008</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>L</td>
<td>78</td>
<td>3,060</td>
<td>39.2</td>
<td>501</td>
<td>6.4</td>
<td>162</td>
<td>2,079</td>
<td>11.8</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>60</td>
<td>2,125</td>
<td>35.4</td>
<td>378</td>
<td>6.3</td>
<td>215</td>
<td>3,595</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>15</td>
<td>375</td>
<td>25.0</td>
<td>50</td>
<td>3.3</td>
<td>104</td>
<td>6,987</td>
<td>9.6</td>
</tr>
<tr>
<td></td>
<td>Total trips with pass</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total trips</td>
<td>2,161</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sofia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>L</td>
<td>613</td>
<td>12,661</td>
<td>20.7</td>
<td>3,328</td>
<td>5.4</td>
<td>251</td>
<td>0.41</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>1,246</td>
<td>25,383</td>
<td>20.4</td>
<td>6,647</td>
<td>5.3</td>
<td>481</td>
<td>0.39</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>868</td>
<td>19,310</td>
<td>22.2</td>
<td>6,293</td>
<td>7.2</td>
<td>521</td>
<td>0.60</td>
<td>15.9</td>
</tr>
<tr>
<td></td>
<td>Total trips without pass</td>
<td>2,727</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>L</td>
<td>173</td>
<td>3,318</td>
<td>19.2</td>
<td>794</td>
<td>4.6</td>
<td>5</td>
<td>0.03</td>
<td>11.7</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>245</td>
<td>4,957</td>
<td>20.2</td>
<td>1,125</td>
<td>4.6</td>
<td>10</td>
<td>0.04</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>168</td>
<td>3,814</td>
<td>22.7</td>
<td>1,014</td>
<td>6.0</td>
<td>14</td>
<td>0.09</td>
<td>13.0</td>
</tr>
</tbody>
</table>
For time per trip, distance per trip and cost per trip we see an increase with income, except for the preferential pass holders in Bucharest, where time and distance per trip (but not cost per trip) show a relationship in the opposite direction. For both cities, the middle incomes show a pattern very similar to the low incomes.

In Bucharest, trips by holders of preferential passes represent 7% of all trips made, and in Sofia this is 18%. This seems to indicate a marked difference between the cities in the policies regarding preferential passes.

**Preferential pass related to income**

The share of preferential passes per income group for all household members and workers separately for Sofia is presented in the following table.

<table>
<thead>
<tr>
<th>Income</th>
<th>With preferential pass [%]</th>
<th>Without preferential pass [%]</th>
<th>Total [%]</th>
<th>With preferential pass [%]</th>
<th>Without preferential pass [%]</th>
<th>Total [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All household members</td>
<td>Workers</td>
<td></td>
<td>All household members</td>
<td>Workers</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>28</td>
<td>72</td>
<td>100</td>
<td>3</td>
<td>97</td>
<td>100</td>
</tr>
<tr>
<td>Medium</td>
<td>14</td>
<td>86</td>
<td>100</td>
<td>14</td>
<td>86</td>
<td>100</td>
</tr>
<tr>
<td>High</td>
<td>4</td>
<td>96</td>
<td>100</td>
<td>8</td>
<td>92</td>
<td>100</td>
</tr>
</tbody>
</table>

For workers, the highest share of pass ownership is found in the medium income class, demonstrating the lack of targeting to the poor. For all household members, the highest share is in the low-income class, but caution must be used here, as poor households without any worker (including the households that face unemployment) were excluded from the survey.

**Trip rate related to preferential pass**

Another interesting issue related to the ownership of a preferential pass is the trip rate. It is often suggested that the trip rate of owners of a preferential pass is higher than people without such a privilege. The following table presents the analysis of the trip rate in the survey for all trips made by workers.
Table 3.6  All workers, trip rate, all trips [average number of trips per worker]

<table>
<thead>
<tr>
<th>Preferential pass</th>
<th>Trip rate workers (all trips)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bucharest</td>
</tr>
<tr>
<td>No</td>
<td>2.41</td>
</tr>
<tr>
<td>Yes</td>
<td>2.68</td>
</tr>
<tr>
<td></td>
<td>Sofia</td>
</tr>
<tr>
<td>No</td>
<td>3.04</td>
</tr>
<tr>
<td>Yes</td>
<td>2.66</td>
</tr>
</tbody>
</table>

The results are contradictory. It appears that the average number of trips in Bucharest for owners of preferential passes is indeed higher than for non-owners of these passes. In Sofia it is the other way around, although the difference between the trip rates is small.

*Income related to car use and ownership*

The data collected allows for an analysis of the relation between income level and car use for work trips, as presented in the next table.

Table 3.7  All workers, car use for work trips [%]

<table>
<thead>
<tr>
<th>Income</th>
<th>Low, Medium, High</th>
<th>% car used for all work trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Bucharest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Sofia</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

This table shows clearly that the car becomes more important for work trips with increasing incomes. In Bucharest the car is used for 13% of all low-income trips to work, whereas the high incomes use their car to go to work in 63% of all cases. In general these shares are higher for Bucharest compared to Sofia, which is not corresponding to the expectations, since the levels of car ownership in the survey as mentioned below table 3.1 is 165 per 1000 in Bucharest and 229 in Sofia.

The relationship between car ownership and income level has been assessed for Sofia (next table).
Table 3.8 All workers, distribution of all cars owned [%]

<table>
<thead>
<tr>
<th>Income</th>
<th>% of all cars owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low, Medium, High</td>
<td></td>
</tr>
<tr>
<td>Sofia</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>8%</td>
</tr>
<tr>
<td>M</td>
<td>34%</td>
</tr>
<tr>
<td>H</td>
<td>57%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

This table shows clearly the increase in car ownership by income level.

**Other key indicators for comparison Bucharest and Sofia**

The above tables indicate many differences between the cities. In order to assess the main differences between the cities, a table with some aggregated key indicators is presented below. Besides the average trip time, distance, cost and speed per PT trip, the costs of a monthly pass as a proportion of the minimum and average country salary are compared.

Table 3.9 Key indicators, Sofia and Bucharest (PT = public transport)

<table>
<thead>
<tr>
<th></th>
<th>Bucharest</th>
<th>Sofia</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of PT, all trips</td>
<td>61%</td>
<td>49%</td>
</tr>
<tr>
<td>% of PT, labour trips</td>
<td>64%</td>
<td>48%</td>
</tr>
<tr>
<td>Avg trip time labour PT (min)</td>
<td>30</td>
<td>32.0</td>
</tr>
<tr>
<td>Avg trip distance PT labour (km)</td>
<td>6.5</td>
<td>7.2</td>
</tr>
<tr>
<td>Avg speed labour PT (km/min)</td>
<td>13.8</td>
<td>13.5</td>
</tr>
<tr>
<td>Avg costs per trip (euro)</td>
<td>0.19</td>
<td>0.21</td>
</tr>
<tr>
<td>Avg cost without privileges (euro)</td>
<td>0.42</td>
<td>0.26</td>
</tr>
<tr>
<td>Avg cost with privileges (euro)</td>
<td>0.06</td>
<td>0.005</td>
</tr>
<tr>
<td>Costs monthly pass PT (euro)</td>
<td>8.36</td>
<td>9.10</td>
</tr>
<tr>
<td>~ % minimum salary</td>
<td>13</td>
<td>16.2</td>
</tr>
<tr>
<td>~ % country average salary</td>
<td>7</td>
<td>7.1</td>
</tr>
<tr>
<td>~ % average salary from survey</td>
<td>9</td>
<td>10.1</td>
</tr>
</tbody>
</table>

In general the difference between the cities is small, although some differences do occur. In Sofia, the share of PT is lower than in Bucharest, perhaps indicating a higher share of trips that are free of charge. Another interesting difference is the average cost per trip using preferential fares. The average distance, trip time and speed are almost the same in both cities.

The table also provides an indication of the overall share of the income spent on PT for labour trips by dividing the costs for a monthly PT pass by the average income. In both cities the monthly pass accounts for approximately 7% of the average country salary and approximately 10% of the average salary of the survey respondents. If confronted with the minimum salary, the share is higher: in Sofia 16% and in Bucharest 13%. It should be noted that these are aggregated figures, not taken into account the specific circumstances.
of individual families. These aggregated figures are confronted with individual records from the survey in the scenarios (section 5.7).

However, a cost of the work trips of 13-16% of the income seems to be high in terms of affordability and may point to hardship, although this cannot be analysed in a travel survey of course. It should be pointed out in this context that the PT operators in both Bucharest and Sofia report high degrees of fare evasion, even if it is difficult to obtain reliable data. As fare evasion was not recorded in the trip diaries, it is probable that the calculations from the survey data overestimate the amounts spent. Still, it can be argued that PT should be affordable without the need for fare evasion.

3.5 Conclusions

The household travel surveys in Bucharest and Sofia are showing some results that are contradictory or different from what would be expected for West European cities of comparable size. This may partly be due to the quality problems mentioned in section 3.3, i.e. the relatively small sample sizes, and the lack of previous local experience with household travel surveys and trip diaries. Household travel surveys are able to show relationships, that cannot be found through the classic “choice-based” travel surveys. In this respect, the surveys are unique and there are probably few ECA cities where household travel surveys have already been conducted. Origin-destination data, which can also be collected through choice-based surveys, were not available for Sofia and Bucharest, and again this is probably the case for most ECA cities.

The possibilities to interpret the results are limited because the analysis could not be linked to transport network data. For budgetary reasons, the surveys were not organised for such a use.

Nevertheless, it is possible to draw a number of conclusions.

**The most important conclusions**

The most important conclusions are:

- Roughly half of all urban trips are made by PT in the two cities.
- The distances travelled by the workers, but also the trips made by their family members, are relatively long. The dwellings and the jobs are located far apart.
- From the perspective of social policy with regard to poor workers, the concessionary fare system is badly targeted. Many poor workers do not enjoy fare concessions, whereas a larger share of middle and higher income workers do.
- Some poor workers appear to spend 13-16% of their income on their work trip. This seems to be rather high.
- There is no clear relationship between income and radius of action in the surveys. The data from the two cities contradict each other.
- Neither is there a clear relationship between the possession or not of preferential passes and the radius of action.
Small difference in key indicators between Bucharest and Sofia

In general the difference between the cities is small, although some differences occur. It appears that in Sofia the privileged fare is much lower than in Bucharest. The average distance, trip time and speed are almost the same in both cities.
4 Secondary data

4.1 Introduction

This chapter presents the existing data (time series) collected for Bulgaria, Romania and Ukraine and, where available, the data for the cities of Sofia, Bucharest and Kiev separately. Secondly some not yet published data on frequencies of selected variables, selected cross-tabulations and some comments from UPT surveys in three cities of the Russian Federation are presented.

The data are clustered around mobility and household expenditures on transport, both covered in separate sections.

4.2 Bulgaria, Romania and Ukraine

Transport data

Our local subcontractors collected the existing data time series. Their sources used are:

- **Ukraine.** National Committee for Statistics.

Based on these data, an important observation regarding trends in PT patronage can be drawn, which was already presented in figure 1.1. All countries show a serious decline in PT passengers carried during the 1990s at country level. The relatively highest decline is seen in bus transport.

In the same period car ownership has substantially increased in all capital cities. Table 4.1 shows this increase.

---

5 Collected by ECORYS-NEI in cooperation with NEI Moscow within the framework of the Public Expenditure Review (PER) in Public Transport and Road Infrastructure Sectors, initiated by the RF Ministry of Finance (MoF) in 2002.
### Table 4.1 Car ownership per 1000 inhabitants

<table>
<thead>
<tr>
<th>Year</th>
<th>Sofia</th>
<th>Bucharest</th>
<th>Kiev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>-</td>
<td>-</td>
<td>166</td>
</tr>
<tr>
<td>1994</td>
<td>286</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1995</td>
<td>-</td>
<td>-</td>
<td>240</td>
</tr>
<tr>
<td>1997</td>
<td>-</td>
<td>220</td>
<td>-</td>
</tr>
<tr>
<td>1998</td>
<td>318</td>
<td>247</td>
<td>238</td>
</tr>
<tr>
<td>2000</td>
<td>344</td>
<td>-</td>
<td>248</td>
</tr>
<tr>
<td>2001</td>
<td>415</td>
<td>315</td>
<td>263</td>
</tr>
<tr>
<td>2002</td>
<td>-</td>
<td>331</td>
<td>-</td>
</tr>
</tbody>
</table>

In 2001 the level of car ownership in Sofia is already equivalent to the current level in many Western European countries, for Bucharest the level is comparable to the situation in the 1980s and Kiev is comparable to the situation in the 1970s in many Western European countries (see Annex B - Working Paper 8 “Trends in Transport”).

### Household expenditure data on transport

In general it should be taken into account that the shares in national accounts are somewhat higher than in Household Expenditure Surveys as national accounts also include non-household travel expenditures.

The following table shows the comparison of the countries regarding the share of expenditures on transport and communications in both urban and rural households.

### Table 4.2 Share expenditures on transport and communications, urban and rural households [%]

<table>
<thead>
<tr>
<th>Year</th>
<th>Bulgaria</th>
<th>Romania</th>
<th>Ukraine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>1999</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2001</td>
<td>8.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2002</td>
<td>7.8</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

In general the expectation is to have rather low budget shares compared to Western European countries, corresponding with low car-ownership levels. According to the above table, Romania is an “outlier” with a rather high share on transport and communications and a low car-ownership.

The table also shows an increasing overall share on transport and communications over time particularly in urban areas. The exception is Bulgaria with a decrease in overall shares.

In the following table, the shares on transport only are presented for Bulgaria and Romania.
If only shares on transport are considered, Bulgaria shows an increase from 2001 to 2002. Therefore, apparently the decrease in table 4.2 is totally caused by a declining share on communications.

The relationship between income level and expenditure for Ukraine is shown in the next table.

**Table 4.4  Share of Transport and Communication in Total Expenditures, urban households, Ukraine, 2001 [%]**

<table>
<thead>
<tr>
<th>Expenditures classes (in Krb.)</th>
<th>&lt;4000</th>
<th>4000-8000</th>
<th>8000-12000</th>
<th>12000-16000</th>
<th>16000-20000</th>
<th>&gt;20.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal transport</td>
<td>-</td>
<td>0.3</td>
<td>0.5</td>
<td>0.9</td>
<td>1.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Public transport (local + intercity)</td>
<td>1.8</td>
<td>2.2</td>
<td>2.6</td>
<td>3.0</td>
<td>3.2</td>
<td>2.6</td>
</tr>
<tr>
<td>Communications</td>
<td>2.5</td>
<td>1.9</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Total Transport &amp; Communications</td>
<td>4.4</td>
<td>4.3</td>
<td>4.7</td>
<td>5.5</td>
<td>6.0</td>
<td>6.1</td>
</tr>
</tbody>
</table>

Source: KIIS and ECORYS, analysis of Ukraine Household Expenditure Survey 2001

In Ukraine the expenditures of PT are about half of all transport and communications expenditures. The PT share is growing with income to a maximum of 3.2% and again declining to 2.6% for the highest incomes.

### 4.3 Russian cities

Within the framework of the Public Expenditure Review (PER) in Public Transport and Road Infrastructure Sectors, initiated by the RF Ministry of Finance (MoF), the Netherlands Economic Institute (ECORYS-NEI) organised a household survey to support public transport policy development. The survey was implemented in three pilot regions in the Russian Federation, the cities of Chelyabinsk, Cheboksary and Khabarovsk, during March 2002. Each regional sample consisted of 450 respondents. The sampling was based on a stratified random walk procedure with basic demographic parameters controlled.

Results of the study have been recorded in the PER Reports to MoF (2002, Russian only). Some not yet published data are presented here: UPT patronage, car ownership, expenditures on transport and privileged passengers. The detailed cross-tabulations for all three cities are presented in Annex B – Working Paper 6 “Secondary data”.

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**Table 4.3  Share expenditures on transport only, Bulgaria and Romania [%]**

<table>
<thead>
<tr>
<th>Year</th>
<th>Bulgaria</th>
<th>Romania</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>2002</td>
<td>5.7</td>
<td>5.6</td>
</tr>
</tbody>
</table>
**UPT patronage**
Some conclusions regarding the UPT patronage:

- The importance of UPT is confirmed; about half of the population uses public transport daily
- The UPT trip-rate is about one, consistent with evidence elsewhere
- The travel time in public transport is about one hour per day
- The modal share of UPT in work trips is 69%, in shopping 55%, in other 64%
- One third of the interviewed households own a car.
- 35% of the interviewees has a preferential pass (privileged)
- The city of Cheboksary is an “outlier” in that average income and car-ownership are significantly lower, 80% of UPT is by trolleybus, at a fare of 60% of the average elsewhere

**Car ownership and transport expenditures**
The following conclusions have been derived:

- The car-owners are more mobile
- Among car-owners there is an over-representation of workers and among non-car-owners an over-representation of retired persons
- The majority of car-owners use UPT for their work trips. This corresponds with the observation that many Russian car-owners store their car during the week and only use it during the weekend
- The expenditures on transport are 2 – 3 times higher than in Household Expenditure Surveys, car-owners 18%, non car-owners 12% of total household expenditure. Although not explicitly investigated, this could be due to an over-estimation of the expenses by the interviewees themselves.

**Privileged passengers**
The following conclusions were drawn for users of concessionary fares:

- Women are over-represented
- Privileged passengers have a significantly lower income, education and car-ownership
- Privileged passengers are less mobile (women less than man)
- More than half of the privileged passengers are retired, particularly women.

### 4.4 Other European countries

As already mentioned in chapter 1, many (European) countries have experienced rapidly increasing incomes and car-ownership during the past decades and the negative impact on public transport patronage and level-of-service. The question is whether ECA countries will follow this trend in a similar way. This section presents some observations from selected statistical data; a detailed analysis is provided in Annex B – Working Paper “Trends in Transport.”
**UPT patronage**
Rapidly increasing deficits in (urban) PT in European countries gave the impetus to a series of studies to analyse trends in PT patronage and subsidies and their causes. In Working Paper 8 a number of graphical compilations are shown, demonstrating:

- Steady growth of car-ownership. It is indicated that during the mid 1960s the level (average 150/1000) was comparable with some ECA countries (e.g. Russia) at the turn of the century.
- Subsidies of PT. It is shown that PT starts running into red figures around the mid 1960s.
- PT patronage. Although there is a wide variation between countries, the overall trend is stabilisation of patronage since the mid 1960s. It has been estimated that without subsidies, the trend would have been significantly downwards.

**Household expenditures on transport**
There is ample evidence that the share of household expenditure on transport is increasing with income:

- At the aggregate level: National Accounts
- At the disaggregate level: Household Expenditure Surveys

In Working Paper 8, macro consumption shares on transport are listed for a series of countries and years during the relevant period 1960 – 1975. The conclusions are:

- The shares are steadily increasing: Europe on average 8 – 12%, other OECD countries on average 12 – 15%.
- These growing shares reflect the growth of car-ownership
- These shares are higher than in Household Expenditure Surveys as National Accounts also include non-household travel expenditures

### 4.5 Conclusions

The following conclusions were derived for the respective cities in **Bulgaria, Romania, Ukraine and the Russian Federation**:

- All countries show a decline in PT patronage during the early/mid 1990s.
- In all cities car ownership is increasing over time, Sofia being the highest in 2001 (415 cars per 1000 inhabitants), Kiev being the lowest (263 cars per 1000 inhabitants).
- The expenditures on transport tend to increase over time; households with higher incomes spend a larger share on transport than lower incomes.

The following observations were made regarding **other (European) countries**:

- The lower income households spend a small share on transport and communications, both in absolute and relative sense
- This is reflecting limited action radius for (income generating) opportunities
- The propensity to spend on the private passenger car is high
- PT for higher income car-owning groups is considered as an “inferior good” (less consumption at rising income)
- PT is considered by higher income car-owning groups as an “inferior good” (less consumption at rising income)
5 Measures and Scenarios

5.1 Introduction: urban structure and travel patterns

In chapter 2 we discussed the urban structure of ECA cities and the way the distribution of activities over the urban territory was shaped by the command economy of the communist period and the lack of market mechanisms in land use. This was illustrated by a study concerning one of the cities of the household travel survey, Sofia. But it is likely that the situation in Bucharest is not very different. Here too, there are large populations concentrated in high-rise panel housing estates in peripheral locations. Originally, these were close to large factories where the inhabitants worked. But since the transition, many of these jobs were lost and there is not much replacement nearby. Moreover, a large part of the central city of Bucharest was razed in the 1980s to allow construction of the very big buildings envisioned by Ceaucescu and his regime, and although there is no lack of plans, much of this area is still heavily underused.

Other ECA cities have very different histories and their pre-communist urban forms vary widely. We have not been able to investigate the effects of communist urban planning in other ECA cities, but it would seem that there are many other cities that developed in the same way in the communist period and that will need quite some time to get back to urban structures that reflect the supply and demand in the market for land use in an efficient way.

Urban form has an influence on travel demand, as was recently demonstrated by a World Bank study, performed on data for cities in the USA. It concluded that decentralisation of housing and jobs can lead to an increase in vehicle miles travelled by households. The household travel survey data discussed in chapter 3, show long average trip distances and the absence of a clear effect of income on the distance travelled. This suggests that there is a link between the inefficient spatial lay-out of post communist cities and the long average distances that workers travel.

Bringing the spatial and the (work) travel dimensions together, we may conclude that in the communist times the problems caused by a lack of co-ordination between the planning of the locations for work and the locations for housing, were solved by the cheap and dependable PT system. And as the urban shape of cities can only change slowly, PT continued to play this role after the transition, and it is bound to continue this in the near future. The communist legacy of urban form means that the job opportunities for people living in the large panel housing estates at the periphery of the city have very

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6 The Impact of Urban Spatial Structure on Travel Demand, World Bank, Development Research Group, Infrastructure and Environment, 2001
little job opportunities nearby and that they have to travel important distances to reach their jobs. This is particularly the case for non-car-owning workers. It is probable that the emerging land market will only gradually have an effect on the spatial distribution of activities, especially of housing. For that period, a dependable and affordable PT system will be a very important success factor for urban economic and social development. Urban planners are advocating to strengthen this role of PT, which is seen as one of the public services the city should offer as a condition for improvement of the economic functioning of the city (along with education, health care, water supply, etc.)

In the long run, with land use and the urban configuration slowly adapting to market conditions, and car-ownership rising, this role of PT is likely to diminish. Other roles, like offering an alternative to congested car travel, will gradually become more important. That is to say that in the long run the position of urban PT will become more comparable to that in West European cities. But the spatial configuration of large cities needs a lot of time to adapt to the new conditions, especially in the many cities that lack a dynamic economic development.

For the time being, PT will have to continue to play its classical role, but the problem is that given the need for maintenance and renewal, the cost of operating and the funds available from revenues and subsidies, the position of PT in many ECA cities does not seem to be sustainable during this period. Service cuts and fare increases seem unavoidable and this diminishes the role PT can play in the improvement of the economic functioning of the city. In particular, this has consequences for the poor workers, who cannot envisage the car as an alternative and who have great difficulty to pay the higher fares.

In this chapter, we do not present an ideal solution with regard to urban public transport and the access to jobs for the poor, but merely suggest a number of possible measures. Furthermore a number of scenarios are presented for which the impacts of different ways to implement these measures on UPT and the way poor workers would use it, is indicated.

5.2 The social function of UPT

The communist regimes often saw urban public transport as fulfilling a basic social need, offering people to move around inside the city. And we have argued that it continues to be essential for the development of many cities whose urban form is still a legacy of the urban planning of communist times.

In Western Europe too, urban public transport is often seen as part of social policy. In fact, there are two main reasons why public transport is subsidised in West European cities.

The first is that of social policy, a means to combat social exclusion and to combat unemployment by making it easier for job seekers to reach new jobs. The aim of this

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social policy is to offer urban transport services to those who otherwise would not be able to make trips. In most West European cities (including Great Britain) this is partly provided through special services (e.g. for certain categories of handicapped people or for school children) and partly through cheap access to regular public transport (often a combination of concessionary fares and a general fare level below costs). The second main reason to subsidise public transport is to offer an alternative to the private car, in order to help combat its negative effects (in terms of environment and safety).

The latter reason is not very present yet in ECA cities, but it may become so as car use continues to increase. The social role of urban public transport, however, is very prominent. This is illustrated by the large number of people who are entitled to concessionary fares. These fare concessions are chiefly motivated by considerations of social policy, although there are also categories for which the social aspect of the policy is less clear. However, in the two cities surveyed in the present study, Sofia and Bucharest, we found that from a social policy perspective, the fare concessions are poorly targeted to the workers. They reach the poor workers to a lesser degree than might be expected. This is probably the case in some other ECA cities as well.

5.3 Intervention strategies

Private initiative may lead to the supply of commercial public transport services, but for the social function to be fulfilled support from the public authorities is necessary. In theory, there are two possible strategies for support:

- payments to the people concerned, either
  - in money (income supplements, subject subsidies) which can be spent freely, or
  - in kind (i.e. it allows only the intended type of consumption);
- cheap fares below cost to all UPT users.

Direct payments in money (income supplements) to the people targeted (in our case poor workers) are the best solution from a purely economic point of view. As the money can be spent freely on any economic good, the consumer can maximise his or her utility by spending it on the good for which he or she has the highest utility. However, this economic advantage is precisely the reason why in practice such subject subsidies are never used. It is politically unacceptable that people who would receive a payment from public funds, e.g. for transport, would use it on any other consumption. Therefore, the only type of direct payment that can be found in practice, is payment in kind. This can take many forms, e.g. a pass that gives the owner the right to buy tickets at a reduced rate, a season ticket that gives the owner the right to an unlimited number of public transport trips in a given period, or coupons that can be traded in for tickets. Terms like “concessionary fares”, “preferential fares” and “privileges” are used for such cases.

The other intervention strategy is offering cheap fares (below the cost of producing the public transport service) to all public transport users, by means of public transport subsidies. This is the strategy most commonly used. It is widespread in Western Europe (not only for social reasons, but also to offer an alternative for the increasing use of the private car). In many cases it is supplemented by direct payment in kind for certain
socially motivated categories of users. This concerns mostly children, the elderly and handicapped people (in as far as they can use public transport), as the general fare is deemed not to be low enough for them.

Both strategies create the need for financial compensation of the operators by the authorities. This is clearly illustrated by the deregulated bus market in Great Britain, where the general fare is at a commercial level, but where the local authorities (for social reasons) can operate compensation schemes that allow fare concessions and socially desirable services to be offered by the operators. It is also illustrated by the subsidies included in the concessions tendered in other countries in Western Europe (which are motivated by social policy as well as by the wish to offer an alternative to car use).

Such subsidies for public transport make each of the intervention strategies sub-optimal from an economic theoretical viewpoint. They produce distortions in the optimal allocation. The most common justification is that the interventions aim to correct market imperfections, that cannot be redressed efficiently in another way. In fact, the communist legacy of inefficient urban form can also be seen as a market imperfection.

5.4 A better targeting of the fare concessions?

The household travel surveys have shown that the preferential fare system in the cities surveyed is poorly targeted from the perspective of the poor workers. The preferential passes are to a higher degree used by the workers form the middle and higher income classes rather than by the poor. It is difficult to give a complete analysis of this targeting, because the surveys did not look at the households without workers, but the higher use of fare concessions by the non-working members of the households surveyed suggests that it is especially for workers that the systems are poorly targeted.

Better targeting of the concessionary fares system has to be part of all the possible interventions discussed in this chapter. Better targeting has two aspects:

- Who is profiting from the concessionary fare?
- For what forms of PT are the concessionary fares valid?

Whatever the source of funding, the concessionary fares have a cost. Therefore it is desirable that those to whom the policy is addressed profit from it, and that others do not. The lists of categories of people who are entitled to concessionary fares in most ECA cities is much longer than what is customary in Western Europe. Often, those lists do not correspond to clear social objectives, but are the result of a large number of separate political decisions, taken at different levels of public authority. A redefinition of the list requires an understanding of the social needs of the population and some understanding of their travel patterns. As this will vary from one city to another, and as it will in the end always be a matter of political judgement, a separate study will be needed for each city. It goes without saying that the authority which decides to grant a fare concession to a category, should also bear the cost of compensation for this category.

In most cases, the concessionary fares in ECA cities are available for travel on the traditional forms of UPT, i.e. metro, tram, trolleybus and full-size diesel bus (and in some
cases urban train services). The minibus services that have grown rapidly after end of communism are generally charging a higher fare (about twice the standard PT fare in Bucharest and in Sofia) and are not honouring fare concessions. This is logical, as they do not get any subsidy, and have to make a profit from their fare box revenues. In many networks, like in Bucharest and Sofia, the minibuses operate on separate routes, where they offer a premium service (not necessarily more comfortable but often faster and more direct), or where they fill gaps in the network. In the latter case rather than the former, it would be justified to include the minibus services in the concessionary fare scheme. This requires a proper compensation to the operator, of course. In a different variant in a few ECA cities, like Khabarovsk, the minibuses operate on the same routes as full-size buses, filling gaps in the timetable. This system has much inefficiency and we will not discuss it further here.

5.5 Raising the fares or lowering the costs?

As the public funds for subsidies and compensations are very tight, especially in ECA cities, there is of course a need to limit the demand by PT on the public budget. This can be done in two ways:

- by diminishing the need for the subsidies or compensations from the public budget (this is addressed in this section);
- by finding a stable source of funding for the subsidies or compensations outside the public budget (this will be addressed in section 5.5).

There are two options to diminish the need for the subsidies or compensations:

- raise the revenues,
- decrease the operating costs.

*Raising the revenues* can be done by increasing the fare levels and by abolishing the concessionary fares. The history of fare policy in Western Europe has shown the limits of the strategy to increase fare levels. In most countries, a fare level at which there would be no need for subsidy was thought to be unattainable, because of the competition from other modes, notably the private car. This would defeat the policy to offer an alternative to car use. Road charging schemes will probably alter this perspective. The experience of the congestion charging system in London, implemented in 2003, will undoubtedly produce interesting lessons. The absence of subsidies for most bus services in Great Britain (and the consequently high fare levels) are also providing interesting lessons, as the role to offer an alternative to car use appears to be very limited. Abolishing the concessionary fares would defeat the social function.

The arguments in the ECA cities are somewhat different. To offer an alternative to car users is not (yet) considered very relevant and the social function is predominant. There is a continuous deterioration of the quality of UPT in most cases. This is well documented in many earlier studies⁸. An important factor contributing to this is the fact that many

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operators do not get sufficient compensation for the costs they incur for transporting the
travellers who are entitled to concessionary fares (travelling for free or at a reduced rate).
In many ECA countries the general fare level is such that fares would cover the
production costs, were it not for the large number of users entitled to concessionary fares.
The authorities often do not have the means to pay full compensations, and indeed one
might say that there is insufficient political priority for sustainable UPT. There are many
studies that suggest that this situation is bound to lead to the collapse of UPT at some
stage.

In the face of this lack of means to compensate the operators for the concessionary fares,
it is suggested from time to time that the fares should be raised, and the fares concessions
abolished. There is little sign however; that the authorities are willing to implement such
a solution, and this is understandable. In section 5.1 it was argued that affordable UPT
has an essential role to play in cities in which the spatial legacy from communism creates
the need for long work trips. The possibilities to raise fares are therefore limited to the
point where the fare level starts to constrain the economic and social development of the
city. Even if it is in practice very difficult to identify this point, raising the fares more
than inflation would require a careful monitoring of the effects on the vulnerable workers
in the population.

Table 3.10 offers an indication of the effect of abolishing the concessionary fares on the
poor workers. The workers earning the minimum salary who pay the full fare, spend 13%
(Bucharest) to 16% (Sofia) of their salary on a monthly pass for PT. A worker losing his
fare concession faces the same percentage as extra expenses.

Decreasing the operating costs is already taking place in ECA cities, in the form of
cutting routes and lowering the levels of service. However, abolishing the monopolies
enjoyed by many operators through the introduction of controlled competition, will also
lead to decreasing costs, without the consequence of lower levels of service. This has
been argued and demonstrated in a number of World Bank publications. We will not treat
this strategy any further here, as interventions on the supply side of PT are outside the
brief of the present study.

5.6 A stable source for financial compensation?

The need to limit the demand by PT on the public budget can also be fulfilled by
finding a stable source for financial compensation. We can distinguish between three
sources of financial compensation:

- from the general tax budgets,
- from taxes paid by specific contributors,
- by the compulsory payments from employers to their employees.

Financial compensation from the general tax budget has the advantage that the burden is
spread over all taxpayers and the distortions in the optimal allocation are therefore
limited. The disadvantage, however, is that the amounts available can fluctuate as a
function of the political process, as there is strong “competition” from other domains of
government spending, as well as from the need to limit total government spending.
Financial compensation from taxes paid by specific contributors has the advantage of a direct relationship between the tax and the way it is used. A disadvantage is that the burden is spread over a smaller group of payers, for whom the effect of distortion is bigger. Compulsory payments by the employers to their employees have the advantage of a direct link between the payer and the beneficiary. The disadvantage is that it increases the cost of labour directly.

Reports about the financial situation of PT in Bucharest and Sofia, as indeed for most other ECA cities, are that the subsidies from the general tax budget are insufficient to guarantee a sustainable supply of PT services. A discussion of the competition with other types of public spending or of the fiscal policy of local and central authorities in general, is outside the scope of this study. But we will discuss some relevant examples form the latter two types of sources.

5.6.1 A transport tax on employers

The first example is the Versement Transport (VT) in France. This tax was introduced in French urban areas in a number of steps between 1971 and 1991, eventually covering all agglomerations of more than 10,000 inhabitants. It is taxing the benefit that employers are supposed to derive from the existence of PT. The provision of PT (financed by the public authorities) means that workers can more easily reach the employment, than if there would be no PT. The benefit to the employers is that their labour market is larger than it would be without PT. The political justification is that it is this benefit which is taxed. In fact, it does not tax this benefit, which would be difficult to measure, but takes the form of a tax on labour by levying a percentage on the sum of the salaries paid by the employers, for all employers of more than nine employees (public and private). Employers who organise themselves (and pay for) the transport of their employees (as is sometimes the case in heavy industry and in the construction trade) are exempt. It is up to the local authorities of urban areas to levy this tax. The law provides for a maximum percentage, increasing with the size of the urban area (number of inhabitants), varying from 0.55 % to 2.5 %. The local authorities are free to implement the tax or not, but they must use the proceeds of the VT for operating subsidies or investments in PT. All of the larger urban areas are using the tax. The annual proceeds amount to 2,260 million euro for the Greater Paris area (2002) and 1,800 million euro for the other agglomerations in France (2001).

Despite some heavy criticisms, this tax has been very successful in France. Both socialist and conservative governments implemented its gradual expansion. It is fair to say that it has been a major factor in the transition from the heavily run down urban PT systems in the early 1970s to the high performance and high quality systems of today. The most important criticism is that a tax which makes employment more expensive, is a premium on replacing workers by machines. Especially in periods of high unemployment, this

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9 Annex B – Working Paper 7 Experiences from the European Union
criticism is made. Nevertheless, the system seems to be well accepted and appears to be a stable factor in the financing of UPT\textsuperscript{12}.

If the idea would be applied to the ECA countries, it would have to be adapted to local circumstances, of course. Small businesses might be exempted, as in France. The tax might be a percentage of the salary (as in the French example), or a fixed fee per employee (which would be easier to implement). But the rationale would be the same: employers (businesses, but public establishments as well) benefit from the fact that their labour market is enlarged by the provision of UPT. The proceeds from the tax should be earmarked to help sustain this provision (through investment and subsidy of the fares).

A simple calculation, based on recent figures for Sofia, produces some insight in the sums involved (all data are for 2002).

<table>
<thead>
<tr>
<th>Operating costs of PT in Sofia (SKGT municipal company)</th>
<th>BGN x million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues from passengers</td>
<td>77.9</td>
</tr>
<tr>
<td>Subsidies and compensations needed</td>
<td>78.4</td>
</tr>
<tr>
<td>of which: borne by the city of Sofia</td>
<td>55.6</td>
</tr>
<tr>
<td>of which: borne by the Ministry of Finance</td>
<td>22.8</td>
</tr>
<tr>
<td>Number of workers</td>
<td></td>
</tr>
<tr>
<td>Jobs in the private sector in Sofia</td>
<td>288,779</td>
</tr>
<tr>
<td>Jobs in the public sector in Sofia</td>
<td>162,156</td>
</tr>
<tr>
<td>Total number of jobs in Sofia</td>
<td>450,935</td>
</tr>
<tr>
<td>Assume 15% of the private jobs to be in small enterprises, to be excepted</td>
<td>43,316</td>
</tr>
<tr>
<td>Then tax to be imposed on the salaries of</td>
<td>407,619</td>
</tr>
</tbody>
</table>

If the total proceeds of the tax would have to be BGN 78.4 million, then the average tax would have to be BGN 192 per worker per year.

The total budget of the city of Sofia for 2002 was BGN 411.5 million. If BGN 55.6 million of the proceeds from the tax would go to the city, this would relieve the city’s budget by 13.5\%. The tax of BGN 192 would represent an increase of 6.5\% on the average annual salary of BGN 3,000. This is much more than what is practiced in France. It is doubtful if it would be politically acceptable.

It should be noted that this calculation supposes that all subsidies and compensation actually paid, would be paid from the proceeds of the tax. But we have seen that targeting of the concessionary fare system can perhaps be improved. This would diminish the need for compensations, and lower the proceeds from the tax that are needed accordingly.

\textsuperscript{12} Alain Meyère: Le financement des investissements de transport public en France et le Versement Transport, Syndicat des Transports Parisiens, Paris, 1999
5.6.2 A fuel tax contributing to public transport.

Since 1966, a part of the fuel tax in Germany is earmarked for investments in local roads and local public transport (Mehraufkommen an Mineralölsteuer). The regulations were changed many times since then, and currently 80% of the proceeds are distributed from the federal government to the municipalities via the 16 state authorities. The other 20% is spent on local investments which are managed directly by the federal authorities, as they are linked to federal infrastructure investments. In 2002, the total budget was €1,677 million, and €829 million of this was spent on local (mostly) UPT.13

This means car drivers are co-financing UPT. Again, a simple illustration of the effect for Sofia is presented. A rough estimate is that the fuel excise tax collected in Sofia is approximately BGN 95 million. If the same amount of BGN 78.4 million for PT would be collected in this way, the fuel tax would have to yield BGN 173.4 million, an increase of over 80%. It is clear that the fuel consumption has to be much higher before such a tax becomes politically acceptable.

5.6.3 The employers pay the fares for their employees

The two examples above are examples of taxes paid by specific contributors. In the next example, the Vale Transporte in Brazil, the employers pay the fare for their employees.14 All employers of more than 10 people in Brazil have the obligation to provide for any costs of travel to work in excess of 6% of the worker’s pay. This is done by the provision of coupons for travel by public transport (the Vale Transporte). The coupons are purchased by the employers from an agency and given to the workers in return for a pay deduction of 6%. The workers give the coupons to the transport operators in place of cash. The operator can then sell the coupons back to the managing agency for the ticket value. This device targets the poorest employees, as those with higher salaries do not choose to accept tickets which would be less in value than the deduction from their pay. The system is not perfect. Some of the very poorest people do not work in the formal sector and therefore cannot get the subsidy. Some are not well served by formal public transport and would prefer to use the informal sector minibus services. And some would prefer to have cash, choosing to walk or cycle to work and use the money for other purposes. For the latter two reasons a secondary market has developed where recipients of the coupons can sell them at a discount, and those who are not recipients, but wish to travel, can buy them at less than their face value. Bus operators can also buy them at less than their cash-in value. The formal sector operators have recently attempted to secure the introduction of a non-transferable electronic coupon in order to prevent other operators, or dealers, from getting the benefit.

14 Quoted from K.M.Gwilliam, from “Cities on the Move”
Despite its problems, the Vale Transporte continues to be a reasonably well-focused subsidy mechanism in a country where there are wide disparities in income levels.

A comparable example is found in France, where, only in the Ile-de-France region (i.e. Greater Paris), employers are legally obliged to reimburse the standard monthly season ticket (Carte Orange), if that is what the employee buys (it should be noted that, because of the Versement Transport, this already has a relatively low price). But as there is no threshold as in the case of the Vale Transporte, this measure is not specifically designed for the needs of the poor.

5.6.4 Inspiration for the choice of an intervention strategy

Like other possibilities, each of the three examples cited above have their disadvantages. The Vale Transporte is more targeted towards the poor than the Versement Transport, but the justification (the provision of public transport makes the labour market for the employer larger) and the effects (the cost of labour to the employer is increased; this can be particularly sensitive in a period of unemployment) are essentially the same. The use of the fuel tax for improvements in public transport has a different justification (car congestion can cause higher costs to public transport operators; car owners benefit from the use of public transport by others). With the expected increase in car ownership in the ECA countries, this will probably be an increasingly useful and acceptable source in the future, but the example of the current situation for Sofia indicates that Sofia is still far removed from this.

We cannot recommend one solution for ECA cities, of course, as it is important to take the local and national conditions into consideration. The examples show how it is possible to tap sources of financial support for UPT, and provide an answer to the challenge (as formulated in section 1.2) to find other ways that will enable operators to improve their cost recovery while at the same time providing preconditions to serve the poor. But this is on the condition, of course, that it is politically accepted that more is spent on public transport.

5.7 A reform of the concessionary fare system

The disadvantages of the current systems of concessionary fares in the ECA countries have been analysed extensively in many studies. To quote a recent World Bank publication:

'It is necessary to simplify and otherwise improve fare structures, and overhaul the fare/subsidy policy to improve targeting. This is especially critical in Russian cities with their numerous and category-based fare exemptions, ill matched with capacity to pay compensation, and weak efforts regarding inspection and fining.'

What is needed is a system that is transparent, for the authorities as well as for the operators. It should also sustain affordable access to jobs for poor workers, which is the object of this study. In fact, it should do this for all workers, but for the less poor, the answer to the question what is affordable is different.

If concessionary fares are being retained as an idea (and it exists also in Western Europe, e.g.), a relatively simple system could be used, using coupons, as in the Vale Transporte example. The coupons, distributed by the public authorities to the people entitled to a concessionary fare, could be exchanged for tickets valid for a single trip (or a trip with an interchange). The beneficiaries would have to hand these coupons to the operator, in exchange for a regular ticket. The operator would turn in the coupons to the authority, and receive a refund for each. In this way, the number of trips made by the beneficiaries could be established exactly, and separately for each operator. The coupons could be handed out to the beneficiaries for free, or at a price (if the policy is for reduced rather than for free travel). The amount of coupons delivered per period (e.g. per month) could be limited, to avoid the unnecessary mobility generated by the ride-at-will tickets used in many cases at present. For a poor worker, this might be 40 coupons per 4-week period, plus e.g. a few extra to make some other trips. An arrangement by which the coupons would be delivered through the employer can be envisaged as well. People with two jobs, or people who have to travel in the course of their job, might receive more coupons through their employer. Obviously, the details have to be adapted to the local circumstances.

In this system, the cost of the trips (either at a reduced or a free fare) would be borne by the authority. The operator would get a repayment for each coupon at which he could run his services in a sustainable way. For full-fare paying passengers, he might set fares that cover his costs. As the operator would have to collect the coupons from his passengers, it would give him an incentive to offer an attractive service to the coupon holders. The minibus services that fill gaps in the network (see section 5.4) could be included in the coupon scheme.

The coupon system approaches the idea of subject subsidies, avoiding the political disadvantages. By having to receive and turn in the coupons regularly, the users will remain aware of the fact that this is not general income, but specifically for public transport. In fact it is similar to the “food stamp” programmes for the poor in the United States.

If the coupons would be delivered to the beneficiaries at a price, it could be made equivalent to the present system of reduced fares, in which the user also pays part of the fare. A combination of the delivery of free coupons and coupons at a price is possible, depending on the degree of need of the beneficiary. For poor people, there might be a few income classes (each higher income class paying a higher price for a coupon). This would then smoothen the effect of a transition into a different category, avoiding the situation that people who start to earn more, have to pay more on transport than their extra earnings (the “poverty trap” in Dutch social welfare terminology).

We have discussed the coupon system for poor workers here, but if used, it should also be applied to all other categories of concessionary fares, in order to maintain the transparency of the system. We think the number of categories of people entitled to
concessionary fares is too large in many cases, and contains too many people who do not really need it. But that is a matter for local or national political judgement, even if a reform of the system is a good occasion for a political review of all categories. For the categories decided by the national government, the coupons might be refunded by the national government to the local government.

The measures proposed above are compatible with the reforms of UPT that have been proposed in other studies, notably with the introduction of regulated or free markets. Apart from the question of fare levels, the possibilities to change the fare structure also merit consideration. Most ECA cities have flat fares, and these might be replaced by distance-based fares. It should be borne in mind, however, that if it is the urban structure that causes the need for long work trips, an extra penalty on distance will not help solve the problems for the poor workers. On the other hand, once the land use market becomes sufficiently responsive to the price of PT, distance based fares may start to stimulate a more compact travel pattern. It is noteworthy that nevertheless the city of Sofia is currently studying the possibility of introducing graduated fares, either distance based or time based. If this happens, it would be interesting to monitor the results.

One important drawback of most fare structures in ECA cities is the fact that the fare is only flat for trips that do not involve an interchange. Interchanges introduce extra physical penalties for the travellers, so it does not seem logical to put an extra financial penalty on top of that. The equity of PT can be improved by introducing a system allowing interchanges on the same ticket, as can be found in most West European cities.

Another possible change to the fare structure is the introduction of price discrimination according to the demand elasticities. In the context of UPT, the possibilities of successful implementation of such schemes seem limited, but the current development of smart card technology for PT may open up new possibilities. However, given the more basic investment needs in many ECA cities, investing in such technologies does not seem to be the first priority.

5.8 The scenarios

In order to sketch how the intervention strategies would impact the supply of UPT to poor workers and their use of it, three different scenarios have been developed. These scenarios are in fact translations of the intervention strategies; each intervention affects either the supply or the demand side of PT for the poor.

The description of the scenarios is as follows:

1. A more targeted concessionary/preferential fare system, that leads to a low fare for all poor people (free transport), but no cheap fare for higher income earners.
2. As Scenario 1, plus more finance for public transport (from fuel taxes) leads to a 20% shorter duration of public transport trips plus 5% more expensive car trips.

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16 See e.g. Advancing Urban Passenger Transport Reform in the Europe and Central Asia Region – Reform Options Report, November 2003, produced for the World Bank by CIE Consult.
3. Abolishment of the concessionary/preferential fares leading to the standard fare to be paid by all travellers. Although not realistic, this scenario could be helpful in knowing what could happen if no other source of finance for the PT could be found.

In the next table the assumed impact (no difference, improvement or worsening) on the radius of action, PT trip time and PT costs as percentage of total income of the scenarios are summarized:

Table 5.1 Assumed impacts of scenarios, in brackets the affected population

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Impacts</th>
<th>PT costs as % of income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted preferential fares for the poor</td>
<td>0</td>
<td>+ (poor people)</td>
</tr>
<tr>
<td>Targeted preferential fares + better level of service of PT</td>
<td>+</td>
<td>+ (poor people)</td>
</tr>
<tr>
<td>Abolishment of preferential fare system</td>
<td>- (pref. pass holders, mix poor &amp; other)</td>
<td>0 (pref. pass holders, mix poor &amp; other)</td>
</tr>
</tbody>
</table>

0 = no difference, + = improvement, - = worsening

The above-assumed impacts, which could be referred to as “synthetic”, are illustrated using actual records from the surveys. In the next box three typical records form the Sofia survey are considered. These families are a mix of high/low incomes, car/non-car owners and owners/non-owners of preferential passes. The work trip for the respective worker in the family is considered in terms of time, costs and distances.
**Individual records from Sofia, work trips**

**Family A**
- 2 adults (male 58 years, female 55 years), 1 child (female 33), no car, living in Slatina district.
- The male adult is employed and earns between 100-200 BGN per month. This income is below average. The male works in Studentski district and travels every day 8 kilometers to work with public transport taking 45 minutes. He pays in total 1 BGN for his return trip, without any preferential fare. This equals in total around 20 BGN per month, 13% of his total income spent on PT (assuming an income of 150 BGN).

**Family B**
- 2 adults (male 51 years, female 56 years), 2 children (male 23 and 26 years), two cars, living in Ljulin district, Sofia.
- The male adult is employed and earns more than 400 BGN per month. The female is also employed and earns 300-400 BGN per month, the eldest son earns 200-300 BGN per month. The male works in Novi Iskar district and travels every day 10 kilometers to work, first 2 by car then 8 by PT and he owns a preferential pass. His PT trips takes 15 minutes, his car trip 5 minutes. His estimated costs are 0.56 BGN for his return trip all made for his car (source: respondent’s estimate), PT is for free for him. This equals in total around 11.2 BGN per month, 2% of his total income (assuming an income of 500 BGN) spend on work trips by car and 1% of the total household income. He spends 0% of his income on PT.

**Family C**
- 2 adults (male 36 years, female 29 years), 2 children (male 8 and 1 years), no car, living in Poduene district.
- The male adult is employed and earns 200-300 BGN per month. The male works in Kremnikovci (probably in the steel works) and travels every day 25 kilometres to work by public transport, taking 70 minutes. His costs are 0 BGN for his return trip, he owns a preferential pass. As a consequence, 0% of his income is spent on PT.

The survey has shown that in Sofia the costs of a monthly PT pass amount to around 10% of the average salary of the survey respondents (see section 3.4). As expected, the presented families from the Sofia survey are not in line with this average, their actual share spent on PT trips to work ranges from 0% to 13%.

For each of the families, the impacts of the scenarios on the expenses for PT as well as the impacts on the travel time for the work trip are calculated using a simplified linear method, namely an average of 0.5 BGN per 8 kilometre equals 0.0625 BGN per kilometres for PT. The results are provided in the following table.
Table 5.2  Impacts on share of income spent on PT and trip time, work trips

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Family A – LOW income, no preferential pass</th>
<th>Family B – HIGH income, preferential pass</th>
<th>Family C – MEDIUM income, preferential pass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PT cost as % of income</td>
<td>Work trip time</td>
<td>PT cost as % of income</td>
</tr>
<tr>
<td>Current % of household income spent on PT</td>
<td>13%</td>
<td>45 min</td>
<td>1%</td>
</tr>
<tr>
<td>Targeted preferential fares for the poor</td>
<td>0%</td>
<td>45 min</td>
<td>1%</td>
</tr>
<tr>
<td>Targeted preferential fares + better level of service of PT</td>
<td>0%</td>
<td>36 min</td>
<td>1%</td>
</tr>
<tr>
<td>Abolishment of preferential fare system</td>
<td>13%</td>
<td>45 min</td>
<td>4%</td>
</tr>
</tbody>
</table>

The table shows that for these three families, the effects of the scenarios in which the preferential pass is abolished are quite dramatic. The family with the medium income and a relatively high distance to work faces in total 25% of its income to be spent on PT trips to work.

In should be noted that these families do not represent the survey average household. The ‘relative importance’ of each typical family should be seen in light of the distribution of preferential passes as provided in chapter 3 (table 3.5). Therefore the overall impact of the different scenarios on low, medium and high incomes with and without preferential passes is not quantified.
6 The wider context

6.1 Introduction

This study focused, as mentioned in section 1.3, on identifying poverty-targeted PT interventions that would provide the right incentives to the public authorities and the urban public transport operators to serve the poor. This is a building block in an overall framework for the Bank and key policy makers in ECA countries in trying to address the problems of their low-income urban populations as regards the access to and prices of Public Transport services and possible solutions.

The low-income urban population form a specific problem in a wider context of urban transport policy. This wider context is addressed in the World Bank’s comprehensive strategy for addressing urban transport matters in the ECA region. This strategy articulates a broad set of principles that will help countries in addressing their urban transport policy agendas and investment priorities, and also serves as a basis for guiding the Bank in providing assistance to these countries.

The following sections describe our observations within this broader strategy for addressing urban transport matters in the ECA region.

6.2 Observations

The scope of the World Bank’s initiatives in UPT is determined by the absorption capacity in the countries and cities, which is – in turn – depending on the available capabilities embodied in persons (policy makers) and institutions. Involvement of the right stakeholders and their capacity building are the key notions here.

Obviously it is difficult if not impossible to draw general conclusions valid for the ECA area at large, from Prague till Vladivostok. Nevertheless, some “average” observations are given below, based on the knowledge gained within the framework of the present project in Sofia, Bucharest, Kiev and the Russian cities Khabarovsk, Chelyabinsk and Cheboksary, and the Consultants’ general experience in the area.

Observations:

- There is little knowledge in the field of public transport policy formulation and planning support.
- The available expertise is mostly concealed in “niches” with government and research institutes. Maybe with the exception of the biggest cities, there is no “community” in which best practice is developed and exchanged.
- International and interregional contacts are usually limited to the national level (Ministry of Transport), but virtually non-existing at the Municipal level. In the case of Oblasts (in the Russian Federation frequently larger than most of the EU Member States), one is basically depending on the National or Federal Government. For example, an Oblast cannot be member of international organizations like the ECMT. Therefore a World Bank’s project “Distance Learning in UPT reform” in the Russian Federation can be considered a significant initiative.

6.3 Lesson learnt in Western Europe

When contemplating capacity building in “UPT policy formulation and planning support”, it is recommended to draw from lessons learnt. In this respect, the European experience with urban public transport is particularly relevant. We assume that, in principle, the ECA countries will follow, with a time lag, similar trends in terms of economic and transport developments.

“Trends in Transport” have been described in Working Paper 8 and are summarized here:

- For a series of ECA countries the expectation is that after a rather volatile transition, a period of sustainable and substantial economic growth has begun or is imminent. For passenger transport, the most important impact is that of the growth of the private car ownership and use.
- At an early stage of passenger car density, say till 150/200 cars per 1000 inhabitants, also public transport patronage will still grow with income. That was the case in Western Europe during the 1960s and in some ECA countries around the millennium. At higher levels of car ownership, UPT generally ran into problems because of:
  - Modal shift from UPT patronage to passenger car use.
  - Urban sprawl: changing economic structure and ongoing sub-urbanization, hence more scattered movements, which are difficult to serve economically by public transport.
  - Car traffic and congestion hampering public transport operations.
  - Steady increase of real wages boosting the unit cost of UPT.

Almost everywhere in Western Europe, UPT was subsidized automatically for losses incurred. These trends proved irreversible, in some countries subsidies were covering up to 80 percent of UPT operating cost. During the mid 1980s, a series of studies carried out on behalf of the EC and ECMT showed clearly that:

- without subsidies, UPT patronage would have been considerably lower, in the range of one third, but
- subsidies had a significant negative impact on UPT efficiency.
Looking back, one can feel that learning the lesson was too expensive. Only after decades of increasing subsidies there was a change in policies, introducing more market mechanisms in UPT provision. Competition was introduced through tendering, aiming at curbing subsidy growth. Another lesson was that – in a way – countries and municipalities were taken by surprise by the rapid development of private car ownership, and transport policy and planning were not ready to face its consequences.

During transition, ECA countries were or are not in the luxury position to experiment with all sorts of subsidy schemes and they headed much faster to private sector participation in UPT provision. First of all this happened for sheer capacity reasons, even allowing private (minibus) operators on the same routes as the public ones (competition on the road). The resulting market conditions are far from transparent, particularly because the private operators do not carry concessionary fare (privileged) passengers, while the public companies do not receive adequate compensation.
7 Conclusions and Recommendations

7.1 Conclusions

The first conclusion from this study is that there is a strong link between the spatial functioning of the cities observed and their PT system. Because of the legacy of communism, in which there was no market for land use, rather inefficient urban structures have emerged in which large concentrations of population are located at the periphery of the cities. The adaptation of the spatial lay-out to market conditions will be a slow process, like all spatial processes.

The result of this spatial layout is found in rather long trip distances, for work trips as well as for others. As car ownership is still relatively low, and half of the trips are made by PT, the PT network fulfils an essential service in bridging the distance between the jobs and the homes. It seems to be essential for the economic and social development chances of the cities.

Interventions in the PT system, including those targeted at the poor population, should carefully consider the spatial dimension of the functioning of the cities.

This means that for the near future the cities need affordable and well functioning PT systems. Therefore, the financial problems that most UPT systems are facing must be solved. This means that interventions are necessary on the demand side as well as on the supply side of UPT. The conclusions about the interventions on the demand side (which are the object of this study) are:

- There is considerable scope for the improvement of the targeting of the concessionary fare system. This would lead to a decrease in the necessary compensations.
- The examples of dedicated taxes show that some forms do not merit further study. The simple quantitative examples for Sofia indicate that an extra fuel tax would require too high a tax increase, and that is also the case for a dedicated tax on wages, albeit to a lesser degree. Perhaps the Vale Transporte can be more acceptable, but this is difficult to say without further study. What can be said is that effect of increasing the cost of labour is much smaller than for the tax on wages, because it is more targeted to poor workers.
- Apart from the improved targeting, a reform of the concessionary fare system itself also offers possibilities to make it more efficient and effective.

However, even if the supply side of UPT is outside the scope of the study, two remarks should be made here, to put the conclusions in perspective. The first one is that the introduction of well-defined Public Service Obligations, as is happening in the ECA countries that now have joined the European Union, with the obligation on the side of the
authorities to pay the associated compensations, will make the situation clearer for the authorities as well as the operators. However, only if the authorities make more public funds available will this lead to substantial improvements in the public transport supply. And an increase of public funding from the general taxes, to maintain the level of service, is not very likely in most or perhaps all cases.

The second remark is that many studies indicate that the introduction of competition “for the market” can lead to cost reductions. An important lesson from the West European experience with public transport subsidies is that it easily leads to a loss of cost control and financial discipline. In a situation where subsidies or PSO compensations remain necessary, introducing competition is the complimentary measure that can keep the pressure on cost control and financial discipline, not only on the operators but also on the authorities.

Looking further ahead, as car ownership continues to grow and the urban structure will slowly adapt to the forces of land use markets, the situation is bound to alter. The role of PT will become less important for the economic and social development of the cities, until the point is reached where car congestion is such that public transport is again needed for further development.

As stated in section 1.3, the objective of this study is to identify poverty-targeted PT interventions that would provide the right incentives to the public authorities and the urban public transport operators to serve the poor. The opportunities mentioned above serve this objective.

This rather wide range of intervention strategies has been translated into scenarios in order to roughly assess the impacts for the poor under certain circumstances. The outcomes show that, in order to fulfil the social function of public transport, a careful balancing of intervention(s) is needed.

7.2 Recommendations

Different professions are studying the transitions in ECA cities with different interests. There is a marked contrast between on the one hand the urban planners, who study the dynamics of urban form in ECA cities and take the provision of UPT for granted, and on the other hand the transport planners, who study the provision of UPT and its many problems and take the urban form and its resulting travel patterns for granted. Our recommendation is as follows:

Urban Planning and Transport Planning research in the ECA region should be brought together in studies in which the interaction between the urban system and the transport system are studied.

As mentioned before, contrary to household expenditure surveys, household travel surveys are still very rare in ECA cities. They should be seen as complementary to other surveys (“choice based” on board travel surveys as well as household expenditure surveys), as they provide insights that cannot be obtained otherwise. These include origin
and destination of the trips, travel purpose, frequency, distance, duration and speed, mode or modes used). The surveys carried out in this study are considered as a pilot exercise, to be built upon in the future. The following recommendation is made:

The experiences gained through the household travel survey, providing detailed knowledge on travel patterns, should be disseminated and extended, e.g. through research institutes and universities.

The question of the influence of the urban form of ECA cities on the travel needs of workers (but also of other people) merits to be explored further. To that end the following recommendation is made:

Future household travel surveys should be organised in such a way that the data can be coupled to a detailed network, allowing a more detailed spatial analysis of the trips.

Besides knowledge on the supply side, knowledge/experience is needed of the market (transport in general, UPT in particular), operations (costing, fare/revenue systems) and concessioning schemes. In Western Europe, capacity is accumulated in research institutes, universities and consultants, and in many urban areas is channelled through a Public Transport Authority (PTA). In ECA countries/municipalities the required knowledge and experience is generally inadequate and access to available evidence (including the lessons learnt) difficult.

The workshop in Bucharest taught us that potential is available. Researchers are eager to catch up with international practice in transport data collection and analysis. However, they are missing a platform of (international) contact for exchange of best practice. “Virtual platforms”, like those provided by the Distance Learning project in the Russian Federation are good examples of ways to bridge the gap.
Annex A Terms of Reference
Annex B  Working Papers