



RĪGAS EKONOMIKAS AUGSTSKOLA
STOCKHOLM SCHOOL OF ECONOMICS IN RIGA

SSE Riga Student Research Papers
2007:1 (88)

PARK&RIDE IN RIGA: AN ANALYSIS OF DEMAND DETERMINING FACTORS

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ISSN 1691-4643
ISBN 978-9984-822-00-6

November 2007
Riga

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March 2007
Riga

Acknowledgements

We would like to express the deepest gratitude to the bachelor thesis supervisor Andris Strazds for guidance through the writing process and provision of valuable commentaries.

We sincerely appreciate the time and effort of the following persons: Ivars Sprinģis, Edgars Sliede, Olita Sproģe, Dmitrijs Soldatenko and all the respondents of the survey.

In addition, we would like to thank our families and friends for help and support during our research.

Abstract

This paper analyzes demand determining factors of Park&Ride system to be implemented in Riga. The reason for this study is contradictory views about the potential success of the implementation. The purpose of the paper is to identify the primary and facilitating Park&Ride demand determining factors, as well as to discover how these factors can be addressed in order to ensure successful implementation of the system. The basic technical demand components are identified based on a series of expert interviews. Afterwards obtained factors are tested with a survey of a sample of B-class vehicle drivers, and an importance of each factor is assessed. Lastly, a case study of a comparable city (in terms of vehicle and population densities, planning, infrastructure, area and population) is performed.

The authors find personal and vehicle security, cost, proximity to public transportation net, public transport waiting time and pace of public transport runs, comfort of interior, ability to take a seat, and information about routes and schedules to be the most essential demand determining factors. In addition, such factors as substantial increase in parking fees in the centre and reduction in number of parking places encourage people to switch to use of P&R. Such factors as proximity to shopping and leisure centres, personnel surveillance, presence of toilets and lifts, lighting and heating conditions, and rent of bicycles appear to be facilitating the introduction as well.

These factors were successfully addressed in Prague's P&R system. Based on the Prague's experience and overall analysis results, the authors provide recommendations with respect to the P&R implementation in Riga.

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1. Introduction

1.1. General Background

With every year a number of newly registered vehicles in Latvia increases by 5% (see Figure 4, Appendix I). Moreover, at the present moment Latvia comes out as the fastest growing car market in the EU (Latvia Automotives Report, 2006). There could be several reasons behind such a rapid market growth: an increasing real wages, a favourable tax treatment, and affordable consumer credits. Another reason could be a comparatively low level of car ownership that the Baltic countries have, if compared to the other EU members (see Figure 9, Appendix VI). For instance, at the beginning of 2006, 1000 Latvian inhabitants on average owned 324 cars (see Figure 5, Appendix I). All the mentioned reasons point at the great market potential. As a consequence, there are strong growth projections for the future.

In addition, 40% of all Latvian vehicles fall on Riga's area (see Figure 6, Appendix I).

If one looks at the same statistical data but from a different perspective, it is possible to realize that along with growing number of cars at the streets, parking space continues to be a scarce commodity. The average time per day a car is used is about 1 hour (Rietveld, 2004). Thus, an additional purchased car demands an additional parking space for 23 hours per day.

Remote districts of the city are able to handle scarcity of parking areas via winning over new territories from suburbs. However, city's centres are already rather closely-packed and no free space for occupying is available. Moreover, many cities are historical heritages, and thus no major constructions that could potentially resolve parking predicaments are allowed. As a consequence, critical scarcity of parking area stays one of the major infrastructure problems in most city centres all over the world, where Riga is by far not an exception from the common rule.

1.2. Problem Description

Many methods of how to decrease the problem of scarcity in parking area are recognized nowadays. These methods differ dramatically in terms of technical complexity; duration of implementation period; cost; and lastly efficiency. Moreover, initial infrastructure of a particular city matters, thus making different parking problem solving mechanisms not equally applicable.

The main method chosen by the Riga City Council and included in the spatial plan for 2006 – 2018 (2005) is called Park&Ride (P&R) approach. The main idea of P&R is the

following: a commuter can leave his or her car on a parking lot at key road crossings few kilometres away from the centre at low or no cost, and then travel to the place of destination by means of public transportation. P&R is considered to be an effective solution in terms of reducing use of private motor cars in city centres (“Park&Ride schemes are effective”, 1999), while staying comparatively inexpensive. The method is widely employed in Europe and the US.

At the moment, the City Council has reserved 23 properties for the upcoming P&R areas that at total share a capacity of 6 thousand vehicles (Baltijas Informācijas Birojs, 2006). The developer of the upcoming project is SIA Imink, which already has other development engagements with Riga City Council, such as a ferrying of transport over the Daugava between Vecmīlgrāvis and Bolderāja. The parking lots are meant to be developed mainly in the destination stations of tram routes. Another sizeable proposal suggested for further implementation is building a large capacity parking area at the railway ring, which would accommodate up to 1500 cars. In addition, a cancellation of free parking during the weekends, as well as more than doubling of current parking tariffs in the centre of the city during the working days (see Figure 12, Appendix VIII) is planned to be introduced. However, the exact date when the tariffs are coming into force is not specified yet.

Funds for implementation and maintenance of both parking problem solutions are going to be redirected from high-fee parking lots profits.

There are a lot of contrasting opinions about the appropriateness of P&R implementation in Riga, as the demand for the proposed scheme is seriously questioned. The notion behind this concern is that the scheme proposed for the commuters is not elaborated and very straight forward. It is argued that practices of successful P&R implementation require reorganization of the whole public transportation system. In support of this idea EU MIMIC Project (“Park&Ride”, 2005) provides a list of key requirements that the P&R should have in order to make it attractive for the users: limited walking distance (not exceeding 100 meters), availability of several types of public transport, protection of the walking path from sun and rain, safety and security of the Park-&-Ride, including barriers around the parking and surveillance by personnel, and many others. The study was conducted on the basis of several decades of P&R practices in the EU. At the present moment the scheme proposed by the City Council meets none of these requirements. Thus, the concern about the absence of demand seems to be reasonable for the authors.

As a result of previous discussion authors put the following research question: **What are the main factors that determine the demand for Park&Ride in Riga?**

The question is split in the following sub-questions that strive to a more thoughtful insight into the research question itself and into a practical implementation of the findings:

- 1) What are the most essential characteristics of Park&Ride in Riga demanded by its users?
- 2) What are those additional factors that facilitate introduction of Park&Ride from the perspective of its users?
- 3) How has a similar city addressed demand side factors of Park&Ride to ensure successful implementation of the system?

2. Structure of the Paper

2.1. Limitations

In this study the authors analyze only drivers that live in Riga or commute to Riga. In addition, the authors ignore any drivers that do not drive a B-class vehicle. The study is based on observations that take place in Riga during January-March 2007. In the study the authors research basic technical demand components. The authors do not go into presenting any mathematical models that simulate traffic movement and thus the authors do not study efficiency of P&R system in this way. Furthermore, the authors do not compare P&R with other possible measures aimed at diminishing congestions in the city centre. Finally, the authors do not discuss in details financing issues associated with P&R, as well as bureaucratic capacity required for the implementation.

3. Review of Literature

As the topic of the present paper causes heated discussions in society, there is much publicly available information in press. Many publications are offered by information agency Baltijas Informācijas Birojs (2006), a lot of attention to the issue is paid by local tabloids such as “Dienas Bizness” (Grinvalds, 2006) and “Neatkarīgā Rīta Avīze” (“Pašvaldību Ministrija Lūdz Ekonomiski Pamatot Maksas Paaugstināšanu Rīgas Autostāvvietās”, 2007). Lastly, the most popular Latvian internet portals, Delfi and Apollo, host discussions of the issue.

However, literature body which could allow building a strong theoretical framework concerning the question of parking is rather undeveloped and provides only a general overview of the subject. As it was mentioned by Young (2000), the topic of P&R has been poorly discussed in transport research literature. Nevertheless, it is possible to classify deterministic P&R characteristics on the basics of many empirical case studies, as well as

differentiate importance of demand influencing factors. Finally, it is important to get an understanding about the overall efficiency of the scheme.

3.1. Demand influencing factors

A valuable overview of the demand influencing factors based on the P&R experience of the North American cities is presented by Robert J. Spillar (1997). Location of P&R facilities is of the first order importance according to the author. This implies sufficient commuters' density around the P&R grounds. It is claimed that 50 percent of demand for the system comes from commuters living and working within a 4-kilometer radius of a P&R facility. In addition, the P&R grounds should not be located too close to a city centre: the minimal allowable distance of 8 kilometres is suggested. A ground should be also located within a visible range of the major roads that lead towards a centre of a city. Locating facilities within this range provides a vital self-advertising. Maximizing a visibility of a facility affects the demand crucially.

The next important factor is security both for a vehicle and a commuter. However, a security system should not create a feeling of imprisonment for its users. As a result, such means as cameras and emergency phones are preferred to a physical guarding and fencing. Moreover, the sense of safety is supported by a regular removal of trash.

Another important factor is a frequent service of public transport. Allowable minimum frequency of public transport runs equals 15 minutes. Convenient access for bicyclists, pedestrians and disabled proved to be an important demand influencing factor as well. A walking distance from a parking lot to a public transport station should be minimized to 120 - 150 meters. Lastly, increase in operating costs of a car use strongly stimulates the demand for the P&R facilities. For instance, a rise in fees for parking in prohibited area, and an increase in parking tariffs in city centres are some of those cost-raising factors.

The most recent and value adding study from the perspective of this paper is the project INTEGAIRE ("Park&Ride", 2005). The study deeply assesses the factors that influence the demand side for P&R in the EU. Large parking areas over 500 parking places are claimed to be much more popular and thus effective than those of merit and small sizes. Frequent and fast public transport runs are essential factors from commuters' perspective. In addition, the demand for the P&R facilities is mostly influenced by safety characteristics, such as supervision, safe pedestrian routes and maintenance of grounds. Satisfaction with public transport is mostly affected by a probability to find a seat. Finally, parking cost considerations are not the least important. Other key requirements are as follows: a walking

distance not exceeding 100 meters and lifts if appropriate; a protection of a walking path from the sun and rain; barriers around parking grounds, and surveillance by personnel; an availability of unoccupied parking lots; and functional and physically separated short-stop areas.

In contrast, the study by Institute of Transportation Engineers (“Park&Ride schemes are effective”, 1999) provides demand decreasing factors for P&R facilities. These are the following: a possibility to get to a centre of a city by private car being quicker and easier than by public transport; an availability of unoccupied parking lots in a city centre; a short duration of a stay in a centre that makes use of P&R not worthwhile.

3.2. Effects of P&R implementation

Further the researchers proceed with the findings about appropriateness and efficiency of P&R scheme.

Sherwin (1998) studied 100 localities in the UK and discovered a great popularity of P&R facilities - over 30 towns and cities were planning to implement a bus-based P&R scheme. What is interesting about the study is the conclusion which sounds as follows: the P&R scheme is not the best solution if it comes to be employed by its own. As the author puts it, the real environmental benefit comes from the scheme if it is matched with public promotion campaigns that encourage cycling and pedestrian journeys, but not simply use of public transport as the first priority. As the author proceeds, the most definite means to make the P&R schemes desirable and popular among commuters is an increase in fees for car parking and reduction in number of parking lots available.

Pickett and Gray (1996) conducted research about the effectiveness of bus-based P&R, where they have studied 10 cities in the UK with P&R systems in place. A conclusion the authors make perfectly supplements the one mentioned previously: P&R is not a panacea in itself, and the way to make it work is to combine it with a wide-ranging transport strategy. Moreover, there are no conclusive indicators of P&R being an effective means to reduce traffic. Lastly, the authors state that none of the P&R schemes studied proved to be operating without tax payers' support.

Parkhurst (1996), who had been examining previous studies in the UK, claimed that the benefit of P&R can be separated into environmental and economic benefits. Moreover, he argues that introduction of P&R promotes economic but not environmental benefits. The author explains this idea as follows: a scheme allows more people to enter city centre area where the major part of businesses is usually located. Thus, the main beneficiary of the policy

is local business. Besides the beneficiary, a benefactor emerges. After P&R implementation the Ministry of Transport bears losses due to an addition to mileage travelled (extended routes) that reduces energy efficiency, increases costs, and as a final result causes dependency of the Ministry of Transport on subsidies. No substantial effect is identified with respect to traffic and air pollution problems.

The study by Victoria Transport Policy Institute (“Park & Ride: Convenient Parking for Transit Users”, 2005) admits several strong effects of P&R that were rejected in the studies of the previously mentioned authors. According to the findings of the study, the main effects are reduction of total traffic, especially during peak periods; shift from automobile travel to alternative modes; increases in ridesharing, use of public transport, and cycling. Positive but insignificant effects were noted in terms of reduction in air pollution, overall safety on roads, and lastly, more efficient use of land in central districts.

4. Methodology

4.1. Research Method

In the analysis the authors used both quantitative and qualitative methods. Concerning the former, the authors conducted a survey among drivers that was aimed at discovering whether there is a demand for the service and if yes, then under what conditions and among what segments of drivers. Along with quantitative methods, the authors implemented qualitative methods as well. The authors conducted a series of interviews with the city officials and independent experts, who have been working on the issue. The aim of the interviews was to collect opinions about the problem and projections concerning the implementation of P&R in Riga. In addition to that, the authors briefly described experience of the successful implementation of P&R in the similar to Riga city in terms of infrastructure and density. The authors aimed to find out how has a similar city addressed the demand side factors to ensure successful implementation of the system, and based on that experience to provide recommendations how P&R could be employed in Riga.

The study is organized as follows. First, the authors conducted a preliminary research in order to construct a questionnaire and get in depth understanding of the situation. Then, the authors designed and tested the questionnaires and distributed it to the public. Further, the authors gathered results and conducted a series of interviews with the experts and officials. Afterwards an analysis of the situation was performed, where the key demand factors for

P&R were revealed. Finally, the authors presented conclusions together with suggestions for future research.

4.2. Preliminary Research

Prior to construction of the final version of the questionnaire and the list of interview questions for the study, the authors conducted a preliminary research. The preliminary research included extensive data gathering from such information sources as the Internet (both Latvian and foreign web sites), publications in the media, and, most importantly, a series of semi-structured interviews with professionals and drivers, during which the authors acquired their personal views of the situation and revealed possible factors that could influence the demand for P&R in Riga. The factors revealed included both the factors already depicted in the literature that covers the issue and those that were omitted, but were still crucial in the context of the situation in Riga.

However, already at this stage of the work the authors elicited several factors that were considered to be crucial for P&R system users. The factors are the following: security (both of drivers and their cars), a proximity of public transportation networks, a comfort of public transportation, an availability of free parking spaces, and additional services provided, such as shopping possibilities.

4.3. Sampling

For population (questionnaire)

The population for the questionnaire included two groups of drivers. The first group is represented by the drivers that live in Riga and reasonably frequently travel by car to or through the city centre. The second group includes the drivers who live outside the city and reasonably frequently travel by car to or through the city centre. The population included people of both genders, any age and any social status. In addition, frequency of their commuting trips did not matter.

Furthermore, the authors aimed to question drivers from different parts of the city, so that the sample was random. The sample contained 167 observations.

For experts (interview)

People who the authors regarded as potential interviewees were officials involved in different areas of the project. The interviewees included the public transport specialist, the expert of

Riga traffic, the specialist in pedestrianism and bicycling, and lastly the developer of the project.

A criterion for arranging an interview was accessibility of a person and his/her professional knowledge. In total the authors interviewed 4 experts. Some experts were contacted more than once.

4.4. Interviews

General description and contacting the respondents

The authors conducted 2 face-to-face interviews with the experts, while another 2 experts were approached via e-mail and telephone. The interviews were of structured and semi-structured types. As a recording method the authors used personal notes.

Question list

A question list for every interview was prepared beforehand, and some questions differed from a person to person. See a sample question list is Appendix III.

4.5. Questionnaire

General description

As a part of the planned fieldwork, the authors constructed the questionnaire in order to find out whether P&R type parking lots are demanded in Riga. In addition, the authors discovered respondents' expectations and requirements with regard to P&R system, for instance, requirements to comfort, security, and cost. Furthermore, socio-demographic background of the respondents was obtained, so that a profile of a person prone to using P&R parking lots could be deciphered. The questionnaire was available in English, Latvian and Russian languages.

Structure of questionnaire

The questionnaire mainly consists of closed type questions. Answers are measured in categorical and ordinal scales. The scales vary from "1 to 7" ranking for the frequency measuring questions, and from "-3 to 3" ranking for the attitude measuring questions.

Testing of questionnaires

Prior to distributing the questionnaire to the public, the authors tested it. The authors wanted the questions to be easily formulated, ethically correct, and answers to be unambiguous.

Therefore the authors asked few people to fill it in and share their opinions. Those people were ordinary drivers, industry professionals and market research specialists. As a result of that, the authors reduced the number of questions, so that the final version of the questionnaire fits into 1.5 pages. In addition, some questions were reformulated.

Contacting respondents

The authors used two ways of contacting respondents. First, the authors approached drivers directly, so that drivers from different parts of the city were represented. In order to achieve that, the authors approached people who were waiting in queues for renewing driving licences and receiving number plates in the Road Traffic Safety Governing Body, Bauskas Street 86. As the second way, the authors launched the questionnaire in the Internet, in order to make it available for any group of people. The questionnaire in Latvian and Russian was available on the free website www.my3q.com.

Questionnaire sample

See Appendix II for full versions of the questionnaire in English, Latvian, and Russian.

4.6. Analysis Techniques

As a technical means for the Internet based questionnaire the authors used the free website www.my3q.com that contains a wizard for creating a questionnaire. For the purpose of the further analysis of the survey results, SPSS statistical software was used. The authors employed basic descriptive statistics together with means' comparison analysis.

4.7. Case study

As a final part of the planned fieldwork, the authors performed an analysis of a case study of successful P&R implementation in a similar to Riga city. The authors performed a search for reports and publications dedicated to the system introduction and operation in different cities. Based on the available information the authors analyzed similarities and differences between Riga and each of the P&R utilizing cities in order to present a case study of a P&R implementation in the most comparable to Riga city. The concept of comparability was measured in terms of city planning, infrastructure, vehicle and population densities, population, and area.

4.8. Reliability and Validity

In order to insure consistency of results, the authors performed collection of both quantitative and qualitative data in several stages. For the purpose of ensuring accurate representation of the total population, the authors increased sample and targeted unrelated groups of people. By implementing mentioned procedures the authors insured reliability of the study. With an aim of ensuring trustfulness of the results, the authors compared the answers received during both qualitative and quantitative parts of the study with the reviewed literature base. In general, the authors used triangulation by employing three different research methods of data collection (literature base review, expert interviews, and survey) in order to ensure the study being both valid and reliable.

5. Results of fieldwork

5.1. Expert Interviews

During the interviews the authors learned about projections for the successful implementation of P&R, as well as identified possible bottlenecks of the implementation process.

Primary demand determining factors

All experts agreed that readiness of the public transport system is the major demand determining factor. By the readiness the experts meant a frequency of running, widely networked routes, and a comfortable interior with seats available. In addition, a small distance from a P&R ground till a public transport stop, as well as safety of a vehicle and a driver were classified as being important. In addition, scarcity of unoccupied parking lots in the city centre and a high cost for private vehicle use (including high-fees for parking and a chargeable entry in the city centre for private vehicles) were named among the most effective means of attracting the commuters to the P&R facilities. Moreover, an advantage of separated public transport lanes that provides the public transport users faster travelling was claimed to be crucial.

Additional demand determining factors

Among the additional demand influencing characteristics the following factors were named: an awareness of a driver about public transport routes linked to a particular ground and an availability of an unoccupied parking lot at the ground; and a proximity of shopping malls

and leisure centres. Safe walking lanes from a P&R ground till a public transport stop, as well as safe cycling lanes from the P&R ground to the city centre were suggested to be rather important.

Suggestion for implementation

The main suggestions for the successful implementation of the P&R system were informing and educating the public about the benefits of P&R. Active marketing campaign that explains the benefits of P&R use was considered to be important.

A payment system for the P&R service was proposed to be integrated with a public transportation payment system; for instance via offering electronic monthly tickets for both services at once. In addition, an implementation of low-floor trams that is taking place from 2009 was regarded as an important part of the P&R project. Lastly, some additional services as an opportunity to rent a bicycle were discussed.

Implementation bottlenecks

Still there are many uncertainties with respect to implementation of the system in Riga. To begin with, it is unclear who will finance the project. Apparently, the local municipalities alone cannot afford the construction, and thus a support should come either from the government of Latvia, or from private local investors or international investors. As for the former, the funds should come through bureaucratic apparatus, what is rather a time consuming way due to political clashes. Private investors, in turn, are not interested in the project unless the law about Public Private Partnership is added to the legislation of Latvia, what would bring more certainty about a pattern of returns on private investments. In that way investors will know what they can count on in case the project becomes a success. Lastly, Riga was denied the European funds that could be used for the construction.

To add more to the point, it was stressed that existing tram routes are not ready for an increase in the load during the peak hours. An alternative, but less realistic solution for the nearest future would be a switch from currently employed ordinary trams to low-floor trams. The low-floor trams are more spacious, take less time for passengers to get in, thus decreasing time spend at each stop. The full switch for the low-floor trams are planned to be completed by 2032.

Moreover, it was claimed by one of the experts that P&R would not be able to solve the problem of traffic jams due to the fact that commercial transport is a major contributor to an increase of number of vehicles.

In general, the authors conceived that an overall perception of the event is rather homogeneous in the eyes of the different experts. Every expert admitted the effectiveness of the system in general, but strongly doubted the possibility for the successful implementation of the system in the nearest future.

5.2. Discussion of questionnaire results

The authors employed two tactics for approaching respondents: an Internet based survey and a direct approach. Although the direct approach method proved to be time consuming, it was successful. In order to collect 110 filled-in questionnaires the authors spent in total 6 hours (divided between 2 days that the authors spent on the field). The Internet based method proved to be rather successful as well. However, out of 87 responses only 57 contained valid answers.

5.2.1. Data restrictions and amendments

Prior to analyzing the results in SPSS software, the authors made some amendments to the data set. In particular, the authors took away those responses that were not completed in full and contained a lot of missing values. In addition, the authors omitted responses with extreme values that could have had a negative effect on the final analysis. Then, the authors transformed the scales of type 'from -3 to 3' to type 'from 1 to 7' in order to avoid confusion during interpretation of the results. Furthermore, the authors decided to exclude from the analysis two questions about accommodation and working places, as considerable part of respondents did not give any answer to the questions. As a result of all amendments, the sample contains 167 observations.

5.2.2. Descriptive statistics

On the basis of the gathered data from the survey the authors obtained interesting results about the demand determining factors of P&R. The authors identified and ranked the key characteristics of P&R that are desired by its potential users.

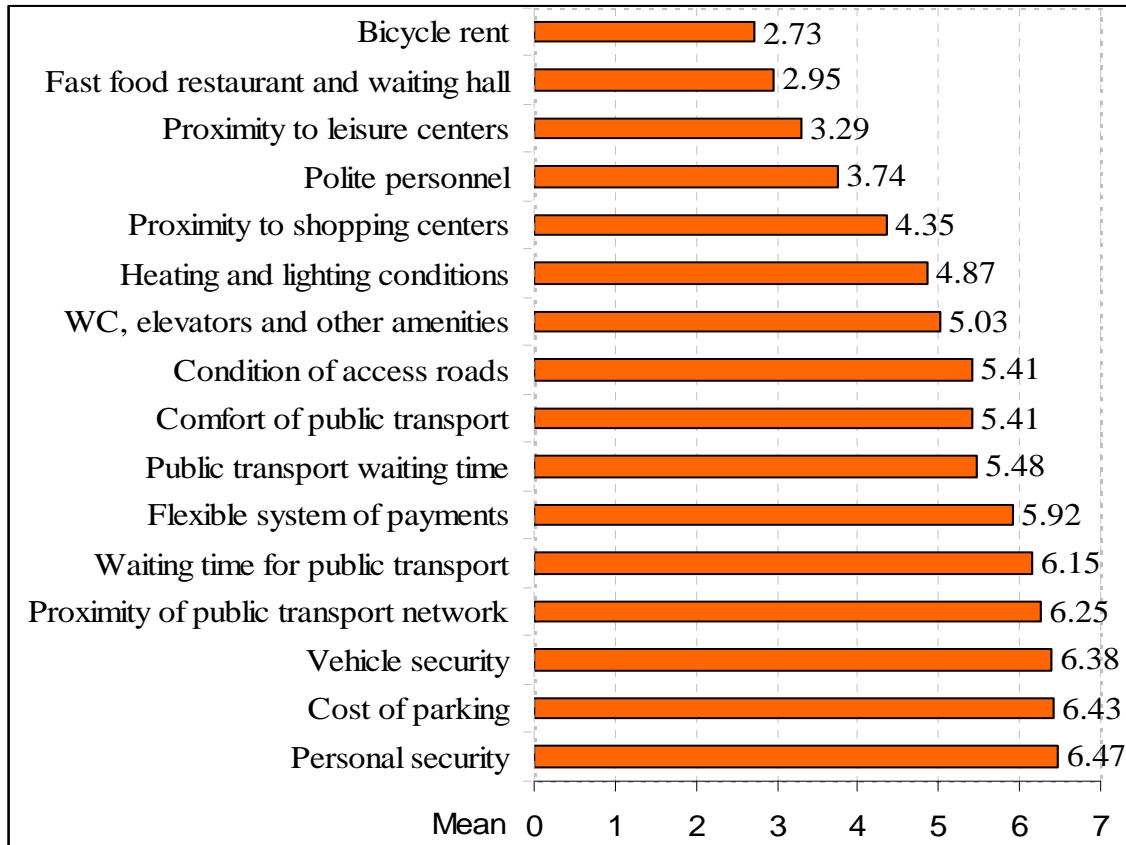


Figure 1: Demand influencing factors ranked by means.

Source: Created by authors using SPSS output, 2007

Figure 1 illustrates the simplified ranking of the demand determining factors based on means of the variables; while Appendix V provides a more advanced summary of the demand determining factors, recorded as SPSS variables, with both means and standard deviations (for the list of the variables and their description see Figure 7, Appendix IV). As it was expected by the authors after conducting the preliminary research and the series of interviews, the respondents are mostly concerned about personal and vehicle security, a cost of parking and a pace of public transport runs. Less important, but still significant are such factors as proximity of public transport networks, a waiting time for public transport and a flexibility of the P&R payment system. These results also come along with the expectations, as these factors constitute a core of the successfully implemented P&R system. However, such an important feature from the perspective of the preliminary research as a parking time

does not appear to be crucial. A comfort of public transport and an access roads' condition also seem to be regarded as the significant yet not crucial factors. Next are ranked features that can be regarded as additional advantages of P&R system. These are a presence of comfortable amenities, i.e. toilets and lifts, heating and lighting of P&R grounds and proximity to shopping centres. It is worthwhile noting that the latter feature has a high standard deviation (see Appendix V), what implies differences in opinions. And finally, those factors that are not essential for the majority of the respondents are ranked. These are politeness and helpfulness of personnel, a proximity to leisure centres such as cinemas, bowling halls or night clubs, a presence of fast food restaurants, and lastly a possibility to rent a bicycle. Again, some of these features have high standard deviations (see Appendix V), what implies that they are demanded by a certain segment of the potential users of P&R.

Apparently, the system of P&R does not consist of parking lots only, although may be comfortable and convenient. Rather than that, P&R is an integrated system of public transportation networks and parking grounds, where public transport has a crucial role to play. Thus it is essential to analyze what should be changed in the public transport system in order to make its services more attractive, and as a result to make the P&R system work. To begin with, the authors found out that the respondents do not use public transport frequently mostly due to its over-crowdedness (see Figure 2, or Appendix V for more detailed information). In addition, public transport is not used because of its pace on a route and a waiting time at a public transport stop. Here a conclusion can be drawn that people feel that

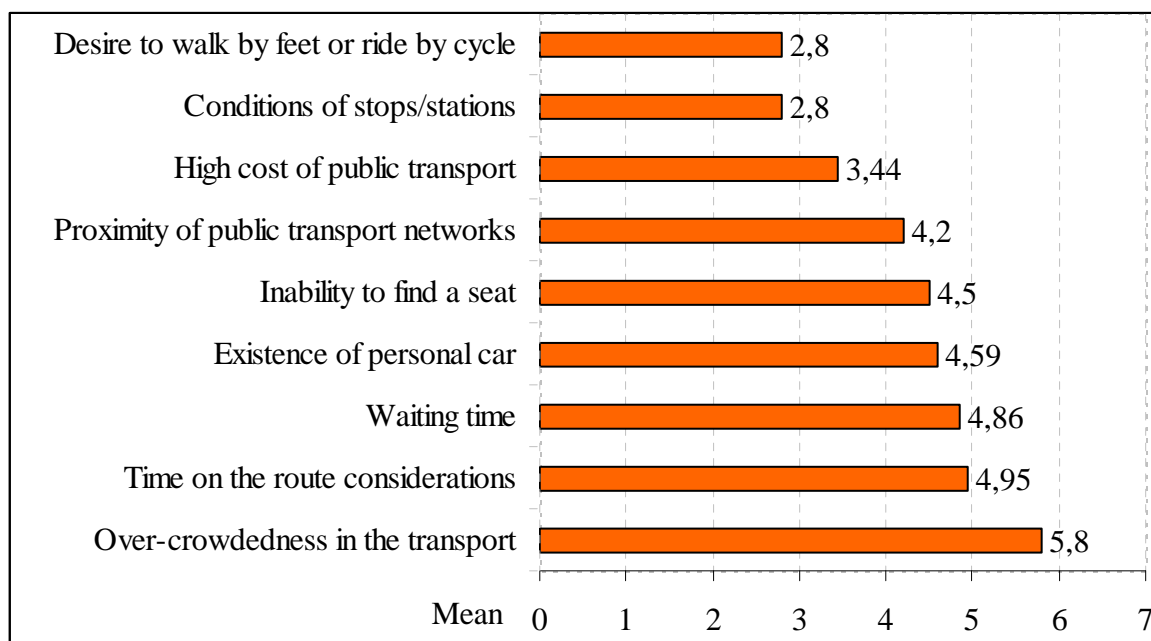


Figure 2: Demand influencing factors ranked by means.
Source: Created by authors using SPSS output, 2007

there is no advantage of public transport versus a personal car with respect to a pace. Furthermore, people have in mind that such aspects as an inability to find a seat, a proximity to public transportation networks and a cost of public transport deter them from using it. It is interesting to mention that a presence of personal car does not have a crucial influence on the choice of transportation type. In other words, the respondents are ready to use public transport more frequently provided it improves in terms of over-crowdedness, pace and waiting time. And finally, such factors as a condition of public transport stops and a desire to walk or ride a bicycle have a relatively low influence.

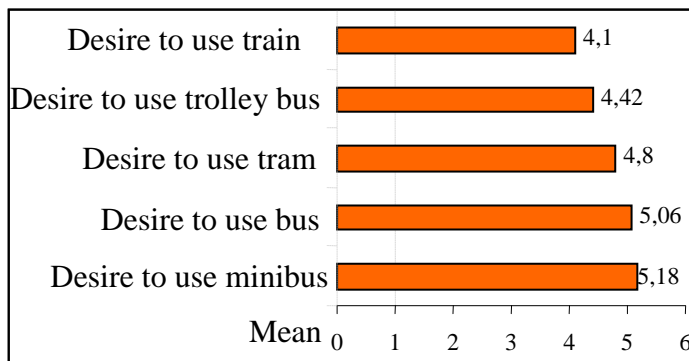


Figure 3: Public transport preferences

Source: Created by authors using SPSS output, 2007

Should the respondents use the services of public transport, they would use minibuses as the first priority, then trams, busses and trolleybuses. However, trains are not such a popular transportation means (see Figure 3, or Appendix V for more detailed information). On the other hand, a popularity of a train can

be easily explained by a limited proximity of its routes.

In addition, there are some interesting facts about a public perception of the implementation of the P&R system. For example, 97% of the respondents think that society is not adequately informed about P&R and benefits associated with it. However, 69.5% percent have heard about the P&R before the day they were asked to complete the survey. Further, it should be mentioned that in general there is no definite opinion about whether the benefits from P&R would offset the costs associated with its construction, and whether introduction of the system will solve the problems of traffic conjunctions in the city (see Appendix V). However, the vast majority of respondents converge to the opinion that city officials fail to do enough to implement P&R. However, such results are attributed to the general mistrust among society to actions of officials. Still in general people believe that P&R should be owned and financed by local municipalities, 66.5% and 60.5% respectively. As for the price of the parking lots, the average price the respondents are willing to pay is about 0.20 LVL per hour. That confirms the idea that the lots should be provided free of charge or at a low cost.

5.2.3. Segmentation analysis

Limitations on data and analysis methods regarding desired features of P&R.

The authors decided not to perform a cluster analysis on features that are required for a successful P&R system. This is done because the authors found that the respondents put a lot of importance on the majority of the features offered for ranking. Because of that the dataset is quite homogenous with respect to that type of questions.

Furthermore, the authors decided not to proceed with a factor analysis, as the authors have rather limited number of factors, and narrowing them further might have lead to misinterpretations of results. Therefore the authors decided not to construct any indexes and analyzed every aspect of the demand separately.

Segmentation

The segmentation of the sample is based on the question about frequency of using a P&R system, if that would have been already in place. This question has a scale that varies from '1' to '7', where '1' refers to 'Never' and '7' refers to 'Always'. The segmentation itself is intuitive and simple. The observations with answers of '1' and '2' are merged into the first group that the authors called 'Pessimists'. These people declare that they almost never are going to use P&R facilities. Then, the second group, called 'Undecided', consists of people whose answer was '3', '4' or '5'. Accordingly, these respondents have not yet decided whether they are going to use the system on the permanent basis or not. And finally, the third group called 'Optimists' responded to the question with numbers '6' or '7', and thus argue that they will definitely use P&R. The results were analyzed with descriptive statistics and means comparison, specifically One-way ANOVA. The means difference of 'Optimists' with respect to 'Pessimists' and 'Undecided' by the variable the authors used for classification is 5.08* and 2.77* respectively, where * refers to being significant at 5% significance level. Figure 15 in Appendix IX summarizes the findings.

Pessimists

This segment consists of 75 observations that constitute about 45% of the entire sample. From Figure 13 (Appendix IX), it is possible to note that these drivers rank most highly such features of P&R as a cost, a personal security, a car security, and a public transport waiting time. However, this group still puts the lowest priority on the car security* among the all segments. Also, a proximity to public transport network* is relatively unimportant for them if

compared to any other segment. Furthermore, this segment is the most concerned with a presence of a fast food restaurant*, as well as with helpfulness of staff*. What is important to mention next is that 'Pessimists' use public transport more rarely than the other segments. In addition, they park in the centre of the city more often, as well as it is easier for them to find an unoccupied parking lot in the city centre during working days than for any other group. As for the reluctance to use public transport, the representatives of this group put more emphasis on a desire to walk or ride a bicycle and an inability to find a seat than the representatives of the other segments. However, such things as a cost of public transport and a condition of stops are less important for this segment than for any other. Then, this segments' representative would avoid to use minibuses* as public transport means more than the others. Furthermore, this group spends considerable amount of money for parking and petrol, and these costs are widely covered by employers. The average age for this group is 27.9, and the driving experience is 8.6 years. This group is ranked the first in terms of the income level, and it seems that its members are more informed about P&R than the others, although the difference is not statistically significant.

To sum up, the representatives of this segment have a relatively constant access to parking lots in the city centre, and some part of costs associated with an exploitation of a car is covered by their employers. In addition, they prefer walking or riding a bicycle. Therefore this group of people have few incentives to use public transport, and as a result lower demand for P&R is observed for this segment than for any other group. Yet, they might be interested in using P&R if useful additional services are provided for them, for instance a fast food restaurant.

Undecided

As well as the previous segment, this one contains 75 observations. In terms of required P&R features, the representatives of this group value the following features the most: a personal security, a security of a car, a proximity to public transport networks, a cost, and a time they have to wait for public transport to arrive (see Figure 14, Appendix IX). In addition, they value a comfort of public transport, a proximity to leisure centres, a closeness to shopping centres* and a presence of comfortable toilets, lifts and other amenities more than anyone else. Interestingly, this segment puts the heaviest emphasis on presence of a personal car with regard to a reluctance to use public transport, as well as a proximity to public transport networks. Over-crowdedness of public transport seems an important obstacle as well. However, if this segment would choose a type of public transport, then a tram* would be

preferred. In addition, the representatives of this group spend the lowest amounts of money on parking and petrol, what in general is not covered by employers. The average age for this group is 29.3, and the driving experience is 8.8 years. This segment has the largest proportion of women than any other. In addition, the drivers from this segment tend to drive the most expensive and new cars.

To conclude, the representatives of this segment put a heavy emphasis on a pace and a comfort of public transport. Thus they might become permanent users of the system if it would provide them with a faster transportation and a higher level of comfort. However, people in this segment regard public transport as a second class transportation means by trying to commute by car, and it may take time to break their perceptions. To achieve that, public transport should become less crowded, more comfortable, and advantageous with respect to transportation time. Moreover, to make them use P&R, parking lots should be located close to large shopping and leisure centres, and to respond to their requirements in terms of toilets, lifts, and other infrastructure.

Optimists

This segment consists only of 17 observations, but it is the most homogeneous one. Thus in terms of ranking of desired features of P&R, respondents place security of a car on the first place (see Figure 15, Appendix IX). Then the following features are listed: a time to wait for public transport to arrive, a proximity to public transport networks, a cost and a personal security. In addition, this segment cares about a condition of access roads*. It is interesting to observe that the drivers in this segment put the lowest emphasis among the segments on a proximity to shopping centres* and leisure centres*, an opportunity to rent a bicycle, a presence of a fast food restaurant*, and helpfulness of staff. Furthermore, respondents more frequently than others travel to the city centre* and use services of public transport*. In addition, it is the hardest for them to find a parking place in the city centre during working days, and presence of a personal car less deters them from using public transport than it does for the other two segments. However, they are reluctant to use public transport more than anyone else due to its cost*. The waiting time* also strengthens their reluctance to use public transport to a greater extent than any other group. In addition, such factors as an over-crowdedness, a time spent on a route, and a condition of stops* are important for them as well, when an idea of going by public transport is considered. The average age for this group is 40.8 (11.3), and the driving experience is 20.4 (10.2) years. This segment drives the cheapest and the oldest cars among the all, and its representatives have the lowest level of

income. However, they are willing to pay* more than the other two segments for the service, and means' differences are statistically significant.

In sum, this segment contains people who care about functionality of P&R, and pay little attention to an additional service provided. Specifically, they care a lot about such practical things as a security, a pace and a cost. It is too expensive for them to leave their cars in the city centre, as well as finding a parking may represent a problem. Although they use public transport more frequently than the others, they are not completely satisfied with its comfort, pace and cost. These people may become dedicated P&R users provided the public transportation system improves.

Discussion of questionnaire analysis results

The questionnaire results show that there is a demand for P&R system, although may be not high at the moment. However, it should be noted that provided some conditions are fulfilled, P&R can become a useful part of everyday life. According to the survey results, all the demand factors can be divided into practical aspects of using P&R parking lots, comfort considerations of P&R parking lots, a comfort of public transport and a pace of public transport. For the practical part of the P&R facilities security, both vehicle and personal, is in the first place. Then, a lot of attention is drawn towards cost. Although there are people who are willing to pay for the services, the survey results showed that the fee should be comparatively low, and ideally the core services should be provided free of charge.

Furthermore, some people require the facilities to be located close to shopping centres, so that their functionality is enhanced. Then, people should feel comfortable in terms of heating, lighting, access to toilets and lifts while using the parking lots. In addition, public transport has to improve substantially. It should become more comfortable and quick, so that more people would be willing to use it. And finally, such a significant factor as integration of public transport network and parking lots should be closely scrutinized, so that the proximity to public transportation networks and the waiting time to be convenient.

5.3. Case study: Experience of the other city

Out of many successful P&R implementation case studies the authors found experience of the capital of the Czech Republic, Prague, to be the most applicable. The reason for drawing this conclusion is based on the similarities between the two cities: none of other successful P&R examples had so many similar characteristics with the capital of Latvia.

Prague and Riga parallels

To begin with, one should definitely mention the geographical closeness between the Czech Republic and Latvia, making both countries EU members. The EU membership allows the authors to assume comparable legislation systems, budgeting and funding. To proceed, one should keep in mind long historical roots of both cities that predetermine specifics of city-planning, for example tightly packed buildings in the cities' centres, narrow streets, and strict rules with respect to any construction works in historical areas. Moreover, both cities are crossed by rivers, what complicates road and parking construction abilities even more and enhances traffic problems at bridges.

Finally, Prague and Riga have nearly the same population densities that is the crucial showing in determining similarity between the two (see Appendix VI). Another important indicator is the cities' vehicle density: in terms of this indicator Riga is far beyond Prague (see Appendix VII). However, the reason for such a gap is in differences in economic development of the countries and the welfare level of its citizens.

Based on the points mentioned above, the authors find the Czech experience in the development of the R&P project to be applicable to the case of Riga.

Dimension of Prague P&R

P&R is constantly developing in Prague. A construction of the first five P&R grounds started in 1997 and the total capacity of the project was equal to 587 vehicles (Kadlec, 2007). However, in August 2006 16 P&R grounds were operating with a total capacity of 2351 vehicles ("Yearbook of Transportation Prague 2005", 2006). By the year 2010 new P&R grounds hosting an additional 7 700 vehicles are planned to be construct; as a result, 10 000 parking lots in total will be available to the citizens of Prague by the year 2010. The very last target is set to 20 000 parking lots in total.

Characteristics of P&R

P&R grounds in Prague are located at a short walking distance from the main rail and underground stations (Kadlec, 2007). P&R parking grounds are included in each of the new underground stations construction framework. Perfect connectivity with the city's public transport is one of the main characteristics of Prague's P&R.

In Prague P&R operates with a guidance system (road signs or electronic boards) that provides drivers with all essential information with respect to P&R. The following information is made available: a name of the nearest P&R, a distance to the nearest P&R,

parking occupancy, a type of follow-up transport that is linked to a particular parking ground, and the departure times of these transports.

All P&R grounds are protected by a fence, and guarded from 4 AM to 1 AM of the next day. During 3 hours from 1 AM till 4 AM nor P&R grounds, neither public transport is operating. (Kadlec, 2007).

P&R promotion

First of all, each city plan provides locations of the P&R grounds (Kadlec, 2007). Network diagrams of public transport obligatory include locations of the parking grounds, and could be picked up by any person from travel information centres of underground stations. Lastly, P&R is advertised in the daily press.

Financial aspect

Both construction and maintenance of P&R have been entirely financed by the Prague City Council and P&R in suburban regions have been financed by the local municipalities. In turn, the P&R service is not free of charge. A fee for P&R is integrated into the public transportation system of Prague. According to a price list (Kadlec, 2007), a cost of a day tickets for the parking service equals 10 CZK (0,25 LVL); a combination of a parking ticket and a transport return ticket costs 30 CZK (0,75 LVL); a combination of a parking ticket and a one-day network ticket costs 60 CZK (1,50 LVL). An overnight fee is 100 CZK (2.50 LVL). The large P&R grounds allow a permanent parking service for local residents, while a monthly fee for individuals amounts to CZK 500 (12,50 LVL) and for business entities to CZK 800 (20 LVL).

Even though the City Council of Prague receives revenues from P&R, the costs appear to offset the revenues. For example, in 2001 annual operating costs of 13 P&R grounds reached 15 million CZK or 262,5 thousand LVL as at 31 December 2001 (Kadlec, 2007). At the same time revenues for the same period amounted to 5.6 million CZK or 98 thousand LVL as at 31 December 2001 (Kadlec, 2007).

Effect of P&R

According to the Institute of Transportation Engineering Annual Reports, P&R proved to be an efficient means to decrease a traffic load in the city's centre, and solved a problem of scarce parking lots via decreasing the demand for space in the inner city. Moreover, the use of P&R proved to be value adding for the citizens due to fuel savings, savings on parking fees in

the city centre, timesaving while using the underground or rail, and safety of a vehicles in a P&R ground.

Summary

Based on the successful experience of Prague in terms of the P&R implementation, the authors are suggesting the following characteristics of the system to be taken into account: P&R grounds are usually large in sizes that ensures an availability of unoccupied parking places; runs of public transport linked to P&R grounds are not influenced by traffic congestions that makes its use more attractive in terms of timesaving; a short walking distance from a ground till a public transport stop; safety of P&R grounds both for vehicles and for drivers; P&R promotion campaigns in the media and widely publicly available information about locations of grounds and linked public transport routes.

6. Conclusions

Primary and additional demand determining factors

After scrutinizing the factors that influence the demand pattern for the P&R system, the authors identified those factors that primarily determine the demand. Thus it was found that personal and vehicle security, a cost of the P&R service, proximity to public transportation, waiting time and a pace of public transport' runs, a comfort of public transport that results in taking a seat, and in-time information about routes and schedules are essential for P&R. Furthermore, such factors as a substantial increase in parking fees in the centre and reduction of a number of parking places encourage people to switch to use P&R. And finally, an informational campaign that advertises the advantages of P&R has an influence on the demand.

In addition, there are factors that facilitate an introduction of P&R from the point of view of its users. Such factors are proximity to shopping and leisure centres, constant personnel surveillance, presence of toilets and lifts, lighting and heating conditions, as well as an opportunity to use a bicycle.

Addressing factors for successful implementation

Prague served as an example of a successful implementation of the P&R system through a thoughtful addressing of the demand determining factors. The demand for both personal and vehicle security is met with a protection of P&R grounds by fencing territories, and a physical guarding during night hours. The demand for fast and frequently running public transport is addressed by using types of transport that are not inflicted by traffic congestions, i.e. street railways, electric trains and the underground. The demand for information about routes and schedules is satisfied through tabloids depicting routes and schedules at P&R grounds, as well as through city plans and public transport diagrams that are available free of charge at travel information centres. Lastly, an informational campaign, which describes the benefits of P&R, is a demand determining factor.

Recommendations for P&R in Riga

As a final conclusion for the study, the authors decide to proceed with a set of recommendations to the Riga City Council concerning the way P&R systems should be implemented in Riga. These recommendations reflect key aspects of the implementation of the similar system in Prague.

The analysis showed that there is a demand for the service, provided certain requirements are fulfilled. In case of Riga, however, some additional demand components should be addressed as people in the 'Undecided' segment should be targeted primarily. The authors can divide the requirements into requirements to parking lots themselves, location requirements, requirements to public transport, and finally promotional requirements.

To begin with, the parking lots should be safe both for users and for vehicles. Then, they should be provided for low cost, so that anyone could afford it. Furthermore, a developed information system is needed, so that a commuter would quickly find a free parking lot and get the latest information about public transport movement schedules. Besides that, the parking lots probably have to be large that will make drivers feel confident with regard to an availability of a free parking lot. And finally, comfortable lifts and toilets together with adequate lighting and heating conditions may be needed to lure the 'Undecided' part of the potential users.

As for location of P&R, the facilities should be closely integrated with public transport routes to make a walking distance as short as possible. In addition, the P&R facilities should

be located close to the main roads, so that any driver could easily access it. And finally, the facilities should be preferably located near large shopping and leisure centres that should enhance popularity of P&R. The previously mentioned facility is especially important with regard to the demands from the 'Undecided' segment.

The requirements to public transport result in necessity to improve its comfort and pace. Public transport should not be overcrowded and a probability to find a seat should be maximized. In addition, public transport should move quicker, what may require investments in such technologies as low-floor trams. However, it is crucial to mention that the culture of a public transport use in Riga should become more developed. The commuters should not perceive public transport as a second class transportation means, but rather take a use of its advantages. It seems to be the most serious obstacle, as a reasonable amount of time may pass for the perceptions to change.

And lastly, such factor as a public promotion of P&R has a noticeable impact on the demand level. Apparently, P&R facilities should be adequately promoted and advertised. The public should be informed about the benefits and the opportunities that the system provides. That means that P&R should be sold to the public as an attractive product, but not as another governmental initiative. This is a serious issue for the case of Riga, as the public is in general uninformed.

It is obvious that in the case of Riga only few of the requirements listed above can be addressed at the present moment. In addition, the city lacks a necessary level of funding needed for the implementation. Therefore Riga might not capture all the benefits of the idea behind P&R. Although the authors expect that some parts of the system are going to work in the nearest future, it may take a number of years for the system to become completely established.

Suggestions for future research

We believe that the topic of P&R provides a wide area for future research. For example, it might be value adding to provide a detailed cost benefit analysis of the system, where economic budgeting together with financial decisions and mathematical simulation models are interacted. This kind of analysis may take advantage of the work as an input data for estimating a demand function. Another possible field for a further study might be carrying out a location analysis, in which every P&R location is scrutinized with respect to the demand

determining components. The present paper could be used to predict occupancy rates of parking lots, as well as be considered in planning and construction decisions.

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Appendix I

Statistical data

1.1

	2000	2001	2002	2003	2004	2005
Heavy vehicles	97 081	99 708	102 734	104 626	107 553	113 113
Buses	11 501	11 294	11 164	10 983	10 740	10 644
Cars	556 771	586 209	619 081	648 901	686 128	742 447
<i>Total:</i>	665 353	697 211	732 979	764 510	804 421	866 204
<i>Annual growth:</i>		5%	6%	5%	6%	8%

Figure 4: Number of vehicles in the Car Register.

Source: Compiled by author using Central Statistical Bureau data (2007)

1.2

	2000	2001	2002	2003	2004	2005
Number of cars as at 1000 inhabitants	235	250	266	280	297	324

Figure 5: Number of passenger cars as at 1000 of Latvian inhabitants.

Source: Central Statistical Bureau (2007)

1.3

Region	Cars	Heavy vehicles	Buses	Trucks	Motor-cycles, Tricycles	Motor-bikes	Quadri-cycle	Total:
Latvia	822011	121120	10628	71773	27210	9664	529	1062935
Region of Riga	67954	9346	702	5907	1829	640	39	86417
Riga	264838	39837	3223	20198	4800	1800	123	334819
Riga & Region of Riga/ Latvia	40%	41%	37%	36%	24%	25%	31%	40%

Figure 6: Number of vehicles in Riga, in region of Riga, and in Latvia.

Source: Compiled by authors from data by Riga Road Traffic Safety Governing Body (2007)

Presence of comfortable toilets, elevators and other amenities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Heating and lighting conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Condition of access roads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Possibility to rent a bicycle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Presence of fast food restaurant and waiting hall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Polite personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Do you think there is enough information about upcoming implementation of park&ride?									
	Yes <input type="checkbox"/>						No <input type="checkbox"/>		
Have you heard before the park&ride before today?									
	Yes <input type="checkbox"/>						No <input type="checkbox"/>		
Do you agree with the following statements?									
	Completely disagree	-3	-2	-1	0	1	2	3	Totally agree
Benefits of Park&Ride will offset costs of its construction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Park&ride will solve the problem of traffic jams in Riga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
City officials do enough to implement Park&Ride successfully.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How much would you be willing to pay for using Park&Ride (per hour, LVL)?						
0 <input type="checkbox"/>	0.1 - 0.25 <input type="checkbox"/>	0.25 - 0.4 <input type="checkbox"/>	0.4 - 0.6 <input type="checkbox"/>	> 0.6 <input type="checkbox"/>		
How much do you spend on parking? (LVL per month)						
< 10 <input type="checkbox"/>	10-25 <input type="checkbox"/>	25-40 <input type="checkbox"/>	40-60 <input type="checkbox"/>	60-80 <input type="checkbox"/>	> 80 <input type="checkbox"/>	
How much do you spend on petrol? (LVL per month)						
< 20 <input type="checkbox"/>	20-40 <input type="checkbox"/>	40-60 <input type="checkbox"/>	60-90 <input type="checkbox"/>	90-120 <input type="checkbox"/>	> 120 <input type="checkbox"/>	
How much of your car expenses (parking + petrol) does your employer cover? (Roughly in %)						
0 <input type="checkbox"/>	<10 <input type="checkbox"/>	10-25 <input type="checkbox"/>	25-50 <input type="checkbox"/>	50-75 <input type="checkbox"/>	> 75 <input type="checkbox"/>	
Who do you think should finance construction and maintenance of Park&Ride systems?						
Municipality <input type="checkbox"/>	Tax payers <input type="checkbox"/>	Only Park&Ride direct users <input type="checkbox"/>	Business sector <input type="checkbox"/>	International investors <input type="checkbox"/>		
Who do you think should own Park&Ride systems?						
Municipality <input type="checkbox"/>	Business sector <input type="checkbox"/>			International investors <input type="checkbox"/>		

Your age: _____	Your driving experience: _____	Gender: M <input type="checkbox"/>	F <input type="checkbox"/>
Education	Secondary school <input type="checkbox"/>	Professional Technical <input type="checkbox"/>	Undergraduate <input type="checkbox"/>
	Bachelor <input type="checkbox"/>		
	Master <input type="checkbox"/>	PhD and above <input type="checkbox"/>	
How old is your car? (in years)			
Less than 1 <input type="checkbox"/>	1- 3 <input type="checkbox"/>	3 -6 <input type="checkbox"/>	6-12 <input type="checkbox"/>
<input type="checkbox"/>			12 -20 <input type="checkbox"/>
			More than 20 <input type="checkbox"/>
What is an approximated current value of your car? (in thousands LVL)			
Less than 1 <input type="checkbox"/>	1- 3 <input type="checkbox"/>	3 -7 <input type="checkbox"/>	7-12 <input type="checkbox"/>
<input type="checkbox"/>			12 -20 <input type="checkbox"/>
			More than 20 <input type="checkbox"/>
What is your average monthly income, LVL? (per one person in household, after taxes)			
Less than 100 <input type="checkbox"/>	101-200 <input type="checkbox"/>	201-300 <input type="checkbox"/>	301-400 <input type="checkbox"/>
			401-500 <input type="checkbox"/>
			more than 500 <input type="checkbox"/>

Thank you for participation!

Source: Created by authors (2006)

Vai Jūs prāt sabiedrībai ir pietiekami daudz informācijas par Park-and-Ride?

Jā Nē

Vai Jūs zinājāt kaut ko par Park-and-Ride līdz šodienai?

Jā Nē

Vai Jūs piekrītat sekojošajiem apgalvojumiem?

	Kategoriski nepiekrītu							Pilnīgi piekrītu
	-3	-2	-1	0	1	2	3	
Ieguvums no Park-and-Ride segs tā ieviešanas izdevumus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Park-and-Ride atrisinās sastrēguma problēmas Rīgas centrā	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pilsētas ierēdņi dara pietiekami daudz, lai ieviestu Park-and-Ride sistēmu Rīgā?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Cik daudz Jūs gribētu maksāt par Park-and-Ride izmantošanu? (LVL stundā)

0 0.1 - 0.25 0.25 - 0.4 0.4 - 0.6 > 0.6

Cik daudz Jūs tērējat uz stāvvietām? (LVL mēnesī)

< 10 10-25 25-40 40-60 60-80 > 80

Cik daudz Jūs tērējat degvielai? (LVL mēnesī)

< 20 20-40 40-60 60-90 90-120 > 120

Kādu daļu no iztērētajiem līdzekļiem Jūsu automašīnai sedz Jūsu darba devējs? (Aptuveni %)

0 <10 10-25 25-50 50-75 > 75

Kam Jūs prāt vajadzētu finansēt celtniecību un uzturēt Park-and-Ride autostāvvietas?

Municipālie valsti Nodokļu maksātāji Tikai tiešie lietotāji Privātais bizness
Starptautiskie investori

Kam Jūs prāt vajadzētu piederēt Park-and-Ride autostāvvietas?

Municipālajām valstīm Privātām biznesam Starptautiskajiem investoriem

Jūsu vecums: _____

Jūsu braukšanas stāžs: _____

Dzimums: V S

Izglītība: Vidēja

Profesionāla

Nepabeigta augsta

Bakalaurs

Maģistrs

Doktors un augstāk

Cik gadus veca ir Jūsu automašīna?

Jaunāk par 1 1- 3 3 -6 6-12 12 -20 Vecāk par 20

Kāda aptuveni ir Jūsu automašīnas cena? (tūkstošos LVL)

Mazāk par 1 1- 3 3 -7 7-12 12 -20 Vairāk par 20

Kāds aptuveni ir Jūsu ienākums mēnesī? (uz vienu cilvēku saimniecībā, pēc nodokļiem)

Mazāk par 100 101-200 201-300 301-400 401-500 Vairāk 500

Paldies par piedalīšanos!

Source: Created by authors (2006)

Состояние подъездных дорог	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Возможность взять на прокат велосипед	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Наличие ресторана быстрого питания и зала ожидания	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Вежливость обслуживающего персонала	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Считаете ли Вы, что общество располагает достаточной информацией о введении в Риге системы Парк-энд-Райд?							
	Да <input type="checkbox"/>						Нет <input type="checkbox"/>
Слышали ли Вы когда-нибудь о Парк-энд-Райд до сегодняшнего дня?							
	Да <input type="checkbox"/>						Нет <input type="checkbox"/>
На сколько Вы согласны со следующими утверждениями?							
	Категорически не согласен(на)						Полностью согласен(на)
	-3	-2	-1	0	1	2	3
Польза от Парк-энд-Райд покрывает расходы по её введению	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Парк-энд-Райд решит проблемы пробок в центре Риги	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Городские чиновники делают достаточно для введения Парк-энд-Райд в Риге	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Сколько Вы бы пожелали платить за парковку Парк-энд-Райд? (LVL в час)						
0 <input type="checkbox"/>	0.1 - 0.25 <input type="checkbox"/>	0.25 - 0.4 <input type="checkbox"/>	0.4 - 0.6 <input type="checkbox"/>	> 0.6 <input type="checkbox"/>		
Сколько Вы тратите на парковку? (LVL в месяц)						
< 10 <input type="checkbox"/>	10-25 <input type="checkbox"/>	25-40 <input type="checkbox"/>	40-60 <input type="checkbox"/>	60-80 <input type="checkbox"/>	> 80 <input type="checkbox"/>	
Сколько вы тратите на бензин? (LVL в месяц)						
< 20 <input type="checkbox"/>	20-40 <input type="checkbox"/>	40-60 <input type="checkbox"/>	60-90 <input type="checkbox"/>	90-120 <input type="checkbox"/>	> 120 <input type="checkbox"/>	
Какую часть Ваших затрат на машину (парковка + бензин) покрывает Ваш работодатель? (Приблизительно в %)						
0 <input type="checkbox"/>	<10 <input type="checkbox"/>	10-25 <input type="checkbox"/>	25-50 <input type="checkbox"/>	50-75 <input type="checkbox"/>	> 75 <input type="checkbox"/>	
Кто, по Вашему мнению, должен финансировать постройку и содержание парковок Парк-энд-Райд?						
Муниципалитет <input type="checkbox"/>	Налогоплательщики <input type="checkbox"/>		Только непосредственные пользователи <input type="checkbox"/>			
Частный бизнес <input type="checkbox"/>	Международные инвесторы <input type="checkbox"/>					
Кто, по Вашему мнению, должен владеть парковками Парк-энд-Райд?						
Муниципалитет <input type="checkbox"/>	Частный бизнес <input type="checkbox"/>		Международные инвесторы <input type="checkbox"/>			

Ваш возраст: _____	Ваш водительский стаж: _____	Пол: М <input type="checkbox"/>	Ж <input type="checkbox"/>
Образование: Средняя школа <input type="checkbox"/>	Профессиональное <input type="checkbox"/>	Незаконченное высшее <input type="checkbox"/>	
Бакалавр <input type="checkbox"/>	Магистратура <input type="checkbox"/>	Докторское и выше <input type="checkbox"/>	
Сколько лет Вашему автомобилю?			
Меньше 1 <input type="checkbox"/>	1- 3 <input type="checkbox"/>	3 -6 <input type="checkbox"/>	6-12 <input type="checkbox"/>
			12 -20 <input type="checkbox"/>
			Больше 20 <input type="checkbox"/>
Какова приблизительная цена Вашего автомобиля? (в тысячах LVL)			
Меньше 1 <input type="checkbox"/>	1- 3 <input type="checkbox"/>	3 -7 <input type="checkbox"/>	7-12 <input type="checkbox"/>
			12 -20 <input type="checkbox"/>
			Больше 20 <input type="checkbox"/>
Каков Ваш приблизительный доход в месяц, LVL? (на одного человека в семье, после налогов)			
Меньше 100 <input type="checkbox"/>	101-200 <input type="checkbox"/>	201-300 <input type="checkbox"/>	301-400 <input type="checkbox"/>
			401-500 <input type="checkbox"/>
			Больше 500 <input type="checkbox"/>

Спасибо за участие!

Source: Created by authors (2006)

Appendix III

3.1 Question list for interviews with experts and officials

1. What are the main demand determining factors for P&R grounds?
2. What are additional factors that may influence demand for P&R grounds?
3. What real benefits Park&Ride will give? Are these benefits somehow calculated?
4. What is done so far in order to inform public about the benefits of Park&Ride?
5. To what extent benefits from Park&Ride are expected to offset costs?
6. In what way Riga can share an experience of other cities in implementing Park&Ride?
7. What are the problems of implementing Park&Ride in Riga?
8. What are solutions to those problems?
9. What are potential threats and risks associated with Park&Ride?
10. At what stage is the process of implementation of Park&Ride, and when the first such parking might be constructed?
11. Why those particular land areas were reserved for the construction of Park&Ride?
12. How infrastructure in suburbs will benefit?
13. How much such service is expected to cost?
14. Who is going to finance the project?
15. Is Park&Ride the only solution for the problem of overcrowding in the centre of Riga? What might be other solutions?

Source: Created by authors (2006)

3.2 List of expert interviews

1. Ivars Sprinģis – the public transport expert - Managing Director of Trams Section, Riga Carriage-Building Plant JSC;
2. Edgars Sliede – the expert of Riga' traffic - Vice-chairman of the Riga department, Road Traffic Safety Governing Body;
3. Olita Sproģe – the specialist in pedestrianism and bicycling - Chairwoman of the International Projects and Bicycling Division, Transport Department, Riga City Council;
4. Dmitrijs Soldatenko – the developer of P&R in Riga - P&R development manager, SIA IMINK.

Appendix IV

4.1

<i>Variable</i>	<i>Description</i>
travel	Frequency of travels to/through the Centre of Riga per week
public	Frequency of using public transport per week
park_c	Frequency of parking facilities in the centre of Riga per week
restr_a	Frequency of parking in restricted areas per week
use_pr	Frequency of using Park&Ride per week if already at place
w_day	Difficulty to find parking places in centre of Riga during working days
h_day	Difficulty to find parking places in centre of Riga during weekends
car_sec	Security of car
pers_sec	Personal security
cost	Cost of parking
tr_wait	Time to wait for public transport
tr_proxim	proximity of public transportation network
park_time	Time to wait for the transport after parking a car
tr_comfort	Comfort of public transport
pay_syst	Flexible system of payments
acces_roads	Condition of access roads
amenities	Presence of comfortable toilets, elevators and other amenities
heat_light	Heating and lighting conditions
staff	Polite personnel
shopping	Proximity to shopping centers
leisure	Proximity to leisure centers (cinemas, theatres, clubs)
fast_food	Presence of fast food restaurant and waiting hall
bicycle	Possibility to rent a bicycle
overcrowd	Over crowdedness in the transport
minibus	Desire to use Minibus
bus	Desire to use Bus
t_route	Time on the route considerations
w_time	Waiting time
tram	Desire to use Tram
p_car	Existence of personal car
seat	Inability to find a seat
trolley	Desire to use Trolley bus
tr_network	Proximity of public transport networks
train	Desire use Train
tr_cost	High cost of public transport
stops	Conditions of stops/stations
feet_bicycle	Desire to walk by feet or ride by cycle
offset	Benefits of Park&Ride will offset costs of its construction
tr_jams	Park&Ride will solve the problem of traffic jams in Riga
officials	City officials do enough to implement Park&Ride successfully
will_pay	How much would you be willing to pay for using Park&Ride
spend_park	How much do you spend on parking

Figure 7: Variables used for SPSS analysis and their descriptions

Source: Created by authors (2007)

5.1 Descriptive Statistics

	Min	Max	Mean	Std. Deviation
spend_petro	1	6	2,98	1,479
will_pay	1	4	1,98	,905
empl_cover	1	6	1,88	1,624
spend_park	1	4	1,56	,787

	Min	Max	Mean	Std. Deviation
offset	-3	3	,00	1,901
tr_jams	-3	3	-,58	2,061
officials	-3	3	-1,87	1,373

	Min	Max	Mean	Std. Deviation
overcrowd	1	7	5,80	1,850
minibus	2	7	5,18	1,704
bus	1	7	5,06	1,662
T_route	1	7	4,95	2,085
w_time	1	7	4,86	2,031
tram	1	7	4,80	1,789
p_car	1	7	4,59	2,334
seat	1	7	4,50	2,170
trolley	1	7	4,42	1,797
tr_network	1	7	4,20	2,186
train	1	7	4,10	2,326
tr_cost	1	7	3,44	2,209
stops	1	7	2,80	2,136
feet_bicycle	1	7	2,80	1,892

	Min	Max	Mean	Std. Deviation
car_sec	1	7	6,13	1,557
pers_sec	1	7	5,92	1,697
cost	1	7	5,90	1,706
tr_wait	1	7	5,89	1,783
tr_proxim	1	7	5,85	1,753
park_time	1	7	5,32	1,752
tr_comfort	1	7	5,32	1,899
pay_syst	1	7	5,23	1,772
acces_road	1	7	5,11	1,867
amenities	1	7	4,83	1,762
heat_light	1	7	4,71	1,819
staff	1	7	4,58	1,851
shopping	1	7	4,40	2,032
leisure	1	7	3,81	2,115
fast_food	1	7	3,38	1,842
bicycle	1	7	3,09	2,050

	Min	Max	Mean	Std. Deviation
travel	1	7	5,69	1,620
public	1	7	3,33	1,991
park_c	1	7	3,34	1,881
restr_a	1	7	2,16	1,693
use_pr	1	7	2,82	2,001
w_day	1	7	3,09	2,057
h_day	1	7	4,66	1,910

Source: Created by authors from SPSS output (2007)

Appendix VI

5.1

	Prague	Riga
Population density	2,392/km ²	2,369/km ²
Population	1,186,618	727,578
City area	496 km ²	307,17 km ²

Figure 8: Comparative data for Riga and Prague.

Source: Combined by authors from Wikipedia (2006), (2007)

5.2

	Number of cars per 1 000 inhabitants		% increase 1990 to 2004	Share of cars, 2004*, %	
	1990	2004		petrol engines**	diesel engines**
EU25	355	472	38	:	:
Belgium	387	467	26	51.1	47.2
Czech Republic	234	373	58	84.3	15.5
Denmark	309	354	20	92.6	7.4
Germany	445	546	27	81.5	18.4
Estonia	154	350	96	85.8	14.2
Greece	170	348	121	:	:
Spain	309	454	63	64.7	35.3
France	414	491	26	56.9	43.1
Ireland	226	385	99	86.0	14.0
Italy	483	581	24	76.4	19.0
Cyprus	304	448	88	90.1	10.1
Latvia	106	297	142	:	:
Lithuania	133	384	167	:	:
Luxembourg	477	659	63	67.3	32.7
Hungary	187	280	45	85.6	13.9
Malta	298	525	102	80.0	20.0
Netherlands	367	429	27	81.4	15.3
Austria	388	501	37	50.8	49.2
Poland	138	314	128	78.4	14.6
Portugal	258	572	135	:	:
Slovenia	289	456	58	:	:
Slovakia	166	222	36	:	:
Finland	388	448	21	87.6	11.7
Sweden	419	456	14	95.0	5.0
United Kingdom	359	463	34	80.9	16.3
Iceland	468	599	47	88.6	11.4
Lichtenstein	594	692	42	87.8	12.1
Norway	380	429	23	92.7	:
Switzerland	442	514	28	91.9	6.9

Figure 9: Comparative data among countries for number of cars per 1 000 inhabitants.

Source: Allen, 2006

Appendix VII

7.1

Year	Prague			
	Vehicles per head*		Passenger cars per head*	
	Veh. per 1 000 pers.	Pers. per 1 vehicle	Cars per 1 000 pers.	Pers. per 1 car
1961	92	10.8	45	22.4
1971	188	5.3	123	8.1
1981	310	3.2	241	4.2
1990	353	2.8	276	3.6
2000	632	1.6	525	1.9
2001	650	1.5	537	1.9
2002	673	1.5	555	1.8
2003	561	1.8	458	2.2
2004	628	1.6	507	2.0
2005	635	1.6	510	2.0

Figure 10: Number of motor vehicles and cars per head in Prague, 2000-2005
Source: „Yearbook of Transportation Prague 2005”, 2006

7.2

Year	Riga			
	Number of persons	Number of vehicle	Veh. per 1000 pers.	Pers. per 1 vehicle
2000	766381	186105	243	4
2001	756627	198062	262	4
2002	747157	211657	283	4
2003	739232	223767	303	3
2004	735241	237540	323	3
2005	731762	241125	330	3

Figure 11: Number of motor vehicles and cars per head in Riga, 2000-2005
Source: Compiled by authors using Central Statistical Bureau data (2007)

Appendix VIII

8.1

Zone	Mon- Fri (8 a.m. -8 p.m.)		Sat (9 a.m. -7 p.m.)	
	Old fee, lvl	New fee, lvl	Old fee, lvl	New fee, lvl
Area bounded with K.Valdemāra Street, Kalpaka bulvāris, Merķeļa Street, Marijas Street and 13.janvāra Street	0.80 - 'Optimists' lvl/h	1 st hour: 'Undecided' lvl/h; Next hours: 1.80 lvl/h.	free	1 st hour: 'Undecided' lvl/h; Next hours: 1.80 lvl/h.
Area bounded with Eksporta Street, Hanzas Street, Pulkveža Brieža Street, Dzirnavu Street, K.Valdemāra Street, Lāčplēša Street and Marijas Street	0.60 lvl/h	1 st hour: 'Optimists' lvl/h; Next hours: 1.60 lvl/h.	free	1 st hour: 'Optimists' lvl/h; Next hours: 1.60 lvl/h.
Area bounded with Hanzas Street, Valdemāra Street, A.Briāna Street, Tallinas Street, A.Čaka Street, Matīsa Street, Valmieras Street, Satekles Street, Dzirnavu Street, Puškina Street, Krasta Street and 11.novembra Street.	0.40 lvl/h	1 st hour: 0.80 lvl/h; Next hours: 1.20 lvl/h.	free	1 st hour: 0.80 lvl/h; Next hours: 1.20 lvl/h.
Other areas	0.20 lvl/h	1 st hour: 0.60 lvl/h; Next hours: 0.80 lvl/h.	free	1 st hour: 0.60 lvl/h; Next hours: 0.80 lvl/h.

Figure 12: Comparative table for new and old parking tariffs in Riga

Source: Compiled by authors using data from Transport Department of City Council (Riga, Transport Department, City Council, 2007) and "Pašvaldību Ministrija Lūdz Ekonomiski Pamatot Maksas Paaugstināšanu Rīgas Autostāvvietās" (2007)

Appendix IX

9.1

	N	Min	Max	Mean	Std. Deviation
Cost	75	1	7	6.28	1.466
pers_sec	75	1	7	6.16	1.644
car_sec	75	1	7	5.97	1.778
tr_wait	75	1	7	5.96	1.906
tr_proxim	75	1	7	5.81	1.843
pay_syst	75	1	7	5.81	1.658
acces_roads	75	1	7	5.49	1.655
tr_comfort	75	1	7	5.32	1.939
park_time	75	1	7	5.21	2.088
heat_light	75	1	7	5.03	1.874
Staff	75	1	7	4.75	1.932
Amenities	75	1	7	4.61	2.085
Shopping	75	1	7	4.12	1.732
fast_food	75	1	7	3.40	1.808
Leisure	75	1	7	3.29	1.887
Bicycle	75	1	7	2.99	2.102
Valid N (listwise)	75				

Figure 13: 'Pessimists' Segment

Source: Created by authors from SPSS output (2007)

9.2

	N	Min	Max	Mean	Std. Deviation
pers_sec	75	4	7	6.71	.693
car_sec	75	4	7	6.64	.607
tr_proxim	75	1	7	6.55	.874
Cost	75	1	7	6.48	.964
tr_wait	75	1	7	6.16	1.242
pay_syst	75	2	7	5.85	1.540
park_time	75	2	7	5.67	1.044
tr_comfort	75	2	7	5.61	1.077
Amenities	75	2	7	5.41	1.209
Shopping	75	1	7	5.13	1.510
acces_roads	75	1	7	5.05	1.262
heat_light	74	2	7	4.77	1.200
Leisure	75	1	7	3.68	1.425
Staff	75	1	6	3.11	1.503
fast_food	75	1	5	2.77	.847
Bicycle	75	1	6	2.67	1.018
Valid N (listwise)	74				

Figure 14: 'Undecided' Segment

Source: Created by authors from SPSS output (2007)

9.3

	N	Min	Max	Mean	Std. Deviation
car_sec	17	7	7	7.00	.000
tr_wait	17	6	7	6.94	.243
tr_proxim	17	6	7	6.82	.393
cost	17	4	7	6.82	.728
pers_sec	17	5	7	6.82	.529
pay_syst	17	4	7	6.65	.996
acces_roads	17	4	7	6.59	.870
park_time	17	5	6	5.82	.393
amenities	17	5	6	5.18	.393
tr_comfort	17	3	6	4.94	.556
heat_light	17	3	5	4.65	.786
staff	17	1	6	2.12	1.996
shopping	17	1	6	1.94	1.676
bicycle	17	1	6	1.88	1.691
fast_food	17	1	5	1.76	1.393
leisure	17	1	5	1.59	1.121
Valid N (listwise)	17				

Figure 15: 'Optimists' Segment

Source: Created by authors from SPSS output (2007)

9.4

Dependent Variable	(I)	(J)	Mean Difference (I-J)	Std. Error
travel	'Optimists'	'Undecided'	.253	.234
		'Pessimists'	-1.231(*)	.385
	'Undecided'	'Optimists'	-.253	.234
		'Pessimists'	-1.485(*)	.385
		'Pessimists'	1.231(*)	.385
public	'Optimists'	'Undecided'	-.480	.242
		'Pessimists'	-2.287(*)	.399
	'Undecided'	'Optimists'	.480	.242
		'Pessimists'	-1.807(*)	.399
		'Pessimists'	2.287(*)	.399
park_c	'Optimists'	'Undecided'	.627(*)	.245
		'Pessimists'	.438	.402
	'Undecided'	'Optimists'	-.627(*)	.245
		'Pessimists'	-.189	.402
		'Pessimists'	-.438	.402
use_pr	'Optimists'	'Undecided'	-2.307(*)	.112
		'Pessimists'	-5.076(*)	.183
	'Undecided'	'Optimists'	2.307(*)	.112

		'Pessimists'	-2.769(*)	.183
		'Optimists'	5.076(*)	.183
		'Undecided'	2.769(*)	.183
tr_cost	'Optimists'	'Undecided'	-.560	.327
		'Pessimists'	-1.907(*)	.539
	'Undecided'	'Optimists'	.560	.327
		'Pessimists'	-1.347(*)	.539
	'Pessimists'	'Optimists'	1.907(*)	.539
		'Undecided'	1.347(*)	.539
stops	'Optimists'	'Undecided'	-.040	.331
		'Pessimists'	-1.958(*)	.544
	'Undecided'	'Optimists'	.040	.331
		'Pessimists'	-1.918(*)	.544
	'Pessimists'	'Optimists'	1.958(*)	.544
		'Undecided'	1.918(*)	.544
w_time	'Optimists'	'Undecided'	-.107	.292
		'Pessimists'	-1.380(*)	.480
	'Undecided'	'Optimists'	.107	.292
		'Pessimists'	-1.274(*)	.480
	'Pessimists'	'Optimists'	1.380(*)	.480
		'Undecided'	1.274(*)	.480
car_sec	'Optimists'	'Undecided'	-.667(*)	.206
		'Pessimists'	-1.027(*)	.339
	'Undecided'	'Optimists'	.667(*)	.206
		'Pessimists'	-.360	.339
	'Pessimists'	'Optimists'	1.027(*)	.339
		'Undecided'	.360	.339
pers_sec	'Optimists'	'Undecided'	-.547(*)	.198
		'Pessimists'	-.664	.325
	'Undecided'	'Optimists'	.547(*)	.198
		'Pessimists'	-.117	.325
	'Pessimists'	'Optimists'	.664	.325
		'Undecided'	.117	.325
tr_proxim	'Optimists'	'Undecided'	-.733(*)	.225
		'Pessimists'	-1.010(*)	.370
	'Undecided'	'Optimists'	.733(*)	.225
		'Pessimists'	-.277	.370
	'Pessimists'	'Optimists'	1.010(*)	.370
		'Undecided'	.277	.370
leisure	'Optimists'	'Undecided'	-.387	.266
		'Pessimists'	1.705(*)	.437
	'Undecided'	'Optimists'	.387	.266
		'Pessimists'	2.092(*)	.437
	'Pessimists'	'Optimists'	-1.705(*)	.437
		'Undecided'	-2.092(*)	.437
shopping	'Optimists'	'Undecided'	-1.013(*)	.266
		'Pessimists'	2.179(*)	.438
	'Undecided'	'Optimists'	1.013(*)	.266
		'Pessimists'	3.192(*)	.438

	'Pessimists'	'Optimists'	-2.179(*)	.438
		'Undecided'	-3.192(*)	.438
acces_roads	'Optimists'	'Undecided'	.440	.233
		'Pessimists'	-1.095(*)	.383
	'Undecided'	'Optimists'	-.440	.233
		'Pessimists'	-1.535(*)	.383
	'Pessimists'	'Optimists'	1.095(*)	.383
		'Undecided'	1.535(*)	.383
fast_food	'Optimists'	'Undecided'	.627(*)	.230
		'Pessimists'	1.635(*)	.379
	'Undecided'	'Optimists'	-.627(*)	.230
		'Pessimists'	1.009(*)	.379
	'Pessimists'	'Optimists'	-1.635(*)	.379
		'Undecided'	-1.009(*)	.379
staff	'Optimists'	'Undecided'	1.640(*)	.287
		'Pessimists'	2.629(*)	.472
	'Undecided'	'Optimists'	-1.640(*)	.287
		'Pessimists'	.989	.472
	'Pessimists'	'Optimists'	-2.629(*)	.472
		'Undecided'	-.989	.472

* The mean difference is significant at the .05 level.

Figure 16: Extract from means comparison table.

Source: Created by authors from SPSS output (2007)