

## Urban movement patterns related to shopping centres – the example of *Lõunakeskus* in Tartu, Estonia

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### Abstract

The shift from an industrial to an information society has changed consumption as we know it. The need to consume has been replaced by the desire to do so. The changes have also occurred in urban transportation, where the private car usage has risen to new heights all around the world. These changes have revolutionised the places and modes of consumption. Personal, highly specialised small corner shops are being replaced by large shopping centres on the fringes of post-industrial cities. A survey we conducted at *Lõunakeskus*, one of the biggest shopping centres in Tartu, Estonia, had a goal to find out the moving habits and analyze the traffic patterns created by the customers. The results show that a majority of shoppers access the shopping centre by car. The customers themselves show great variety according to their social background, making the shopping centre truly “a place for everybody”. The majority of the customers visit the centre approximately 2–3 times a week and some important differences occur between the in-week and the weekend customers. The distance dependence occurring between the region of living and the modal split seemed to have reliance on the mode of living – the car usage was at its maximum in the low-density suburban regions in the transition zone, while the bus was used much more frequently in the more distant periphery zone of high density apartment blocks. The urban fringe shopping centres are still a relatively new sight in the landscape of Tartu, while *Lõunakeskus* was opened in 2001 as the first big shopping centre in south Estonia.

*Keywords: modal choice, shopping centres, urban movement, public transport, transport planning.*



## 1 Introduction

The social changes of the last few decades have created a consumption-oriented society. As technologies develop, employment will shift from manufacturing to services and the volume of sales will become more important than manufacturing capacity. At the same time, cars have become the main means of transportation within cities, which in its turn has increased people's mobility and has dispersed the city structure. The spatial retail structure has also changed – besides highly specialised small inner-city shops; there are now also many large self-service out-of-town shopping centres. Consumption has significantly increased; consequently the importance of city traffic has also increased. In addition to commuting between home and work, short shopping trips are also rapidly gaining prominence in everyday traffic, and the volume, patterns and channels of city traffic increasingly depend on city transportation management and the configuration of shopping centres. Although consumption landscapes are gradually becoming more homogenous all over the world, consumers themselves within those landscapes are becoming more and more individualistic. Small shops close to home become out-of-town shopping centres and modern rational and reasonable consumers turn into post-modern playful-ironic, unpredictable and unclassifiable wanderers. Only a few most general theoretical models still apply and the research can rely only on the particular context.

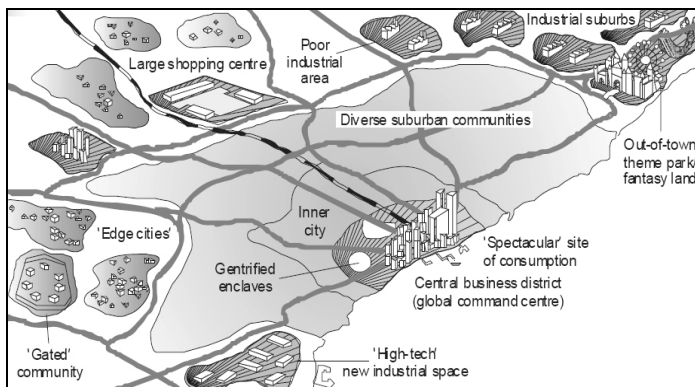


Figure 1: Post-industrial city and the out-of-town supermarket [3].

The spatial configuration of retail establishments has developed in response to the changing needs of consumers and the locations of retail establishments are chosen in consideration of the mobility and availability of consumers. The amount of free time within households has decreased significantly due to the growth of the share of women on the labour market; as a result, people try to spend less time on shopping. Less free time and the possession of a car leads to bigger shopping quantities, which in its turn strengthens car dependency [1].

The average amount of living space per person has also increased, leading to the diffusion of city structure. The concentration of population within the

traditional catchment areas of retail establishments has also dropped, resulting in the expansion of catchment areas. More spacious living conditions, however, provide the opportunity for consumption in larger quantities [2]. Modern shopping centres target car owners and are usually located on the fringes of cities, where they can be easily accessed by car and where parking lots can be constructed on large tracts of relatively cheap undeveloped land (Figure 1). In consideration of the limited free time of customers, shopping centres offer as wide a variety of services and goods as possible, allowing customers to obtain everything “at one place and fast” and provide retailers with a captive market. Multifunctional out-of-town retail complexes have developed [3].

## 2 Material and methods

With respect to human flows, it is convenient to classify retail establishments on the basis of their “pull”. The major pull factors are the size of the retail establishment (variety of goods, services and leisure opportunities) and its accessibility. In terms of human flows, we can distinguish between three major retail areas in Tartu (Figure 2). These are the traditional city centre with its excellent accessibility, Annelinn with its new shopping and leisure centre Eeden and with a third of the population of the city, and the Ringtee area, where the Lõunakeskus retail park and other smaller retail establishments are located and which is easily accessible to car owners. In addition to those big three, mention should also be made of the smaller retail area of Ropka, although compared to the others, its volume of sales and attractiveness are clearly inferior.

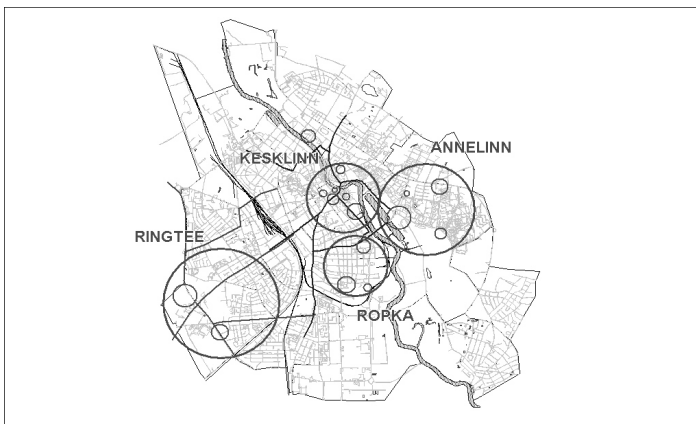


Figure 2: Major retail areas in Tartu in 2004.

Lõunakeskus is the first and largest retail park in South Estonia. Situated on the southern edge of Tartu, in the immediate vicinity of the Riia Road roundabout, Lõunakeskus primarily targets high and average spending customers, who have access to automobiles and who live in Tartu and the surrounding counties within one hour's drive [4]. Lõunakeskus has the largest

parking lot of all the retail establishments in Tartu (parking space for nearly 700 cars) and only Eeden can compete with Lõunakeskus in terms of the variety of goods offered. Therefore, Lõunakeskus is most certainly one of the most important shopping centres in Tartu, especially for car owners.

Lõunakeskus as a shopping centre was opened in August 2001. At the moment, more than 50 retailers and service providers occupy the 24,000 m<sup>2</sup> floor space available, expects to serve 3m customers, which amounts to nearly 10,000 customers per day [4].

For the present study, a customer survey was conducted at Lõunakeskus. The survey sample consisted of 500 individuals, who were distributed over weekdays and time of the day following the general pattern of customer visits in 2004 (Figure 3). Based on previous surveys, respondents were selected at random from customers entering the shopping centre. This year, another survey was conducted among the customers leaving the shopping centre to complement the surveys of the previous years. Its main purpose was to determine the length of the customers' stay at the shopping centre.

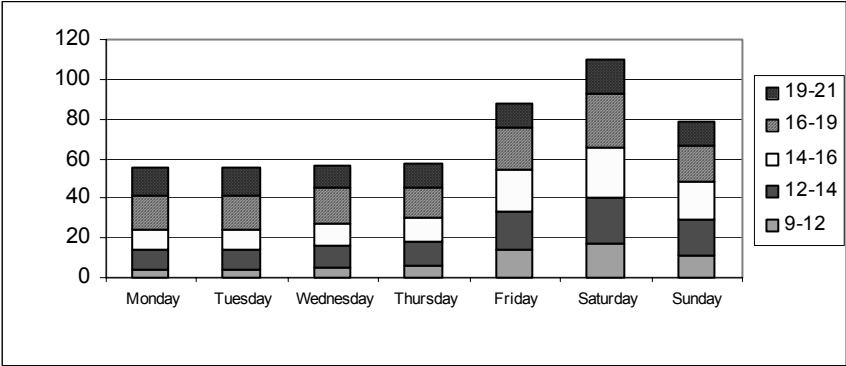


Figure 3: The number of respondents by weekdays and time period of the day.

Since almost all variables were nominal, we used cross tabulation to find the associations between variables and  $\chi^2$  and Cramer's V to test the statistical significance and the strength of associations. The significance level  $\alpha$  specified for the test was 0.05. We used SPSS 11.0 for statistical data processing.

### 3 Results

The proportion of men and women among the 500 respondents was almost equal. Adding the results of the exit questionnaire, altogether we questioned 509 men and 491 women during 7 days. As in previous surveys, the respondents were divided into age groups. Compared to the age and gender distribution of the population of Tartu, the survey shows the overrepresentation of the 31–35 age groups and the under representation of older age groups. No significant statistical



dependencies were detected between age and gender; the only larger deviation occurred in the 46–55 age group, where the significant majority were men (i.e. residual=2.6).

Nearly 80% of the customers came by car, 10% came on foot and nearly 8% came by bus (Figure 5). The largest share of customers travelling by car had somebody else accompanying them (34%); over one quarter came alone and very few had more than two passengers.

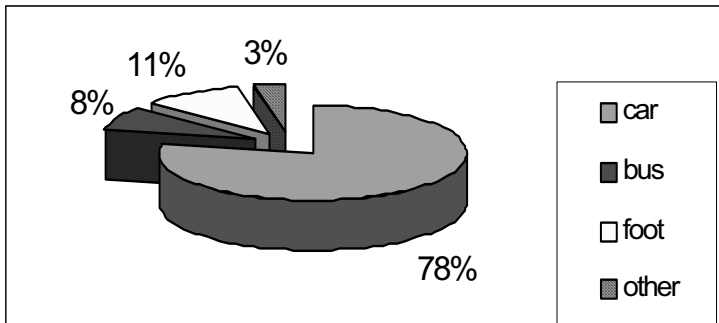


Figure 4: The modal split of the customers of *Lõunakeskus*.

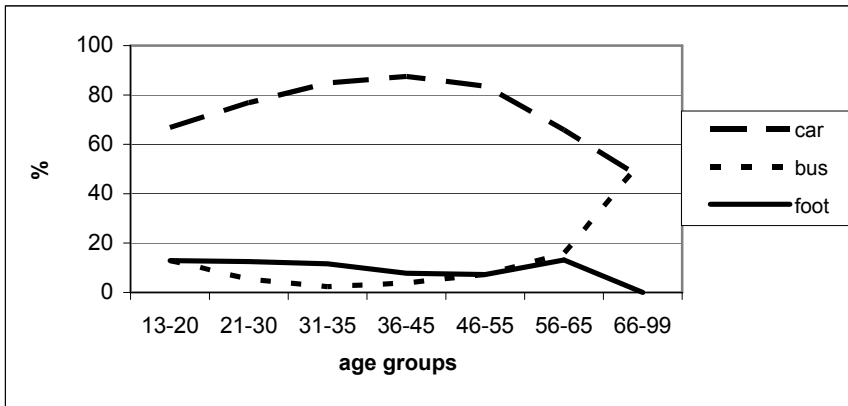


Figure 5: The dependence between the age groups and modal split of transportation in the *Lõunakeskus* survey.

Although the majority of the customers come by car, the choice of transportation among age groups varies considerably. As the age of the customer rises, so does the preference for car use, peaking in the 36–45 age group, where the share of car users nearly reaches 90%. The share of pedestrians remained mostly stable at 10%, being a little lower in the 30–40 age groups and falling to zero after 66 years of age. The bus is preferred over the car in the oldest age group. Middle age groups, which constitute the main clientele of *Lõunakeskus*, use the bus significantly less (Figure 5).

The survey shows a statistically significant dependence ( $p=0.048$ ) between the gender and modal split; car use is higher among men. 84% of male customers and 73% of female customers use car. There is a very strong correlation between the car occupancy and the weekday. The weekend was clearly different from the rest of the week, as on Friday 49% of the car-using customers came alone (residual=2.2), but on Saturday only 18% came alone (residual=-3.4). There is no clear dependency between the number of people in a car and the time of the day, and the number of people in a car is not statistically dependent on the age group, although people in the 36-45 age group were more inclined to come alone (i.e. residual= 1.8).

3.1 Duration of visits

In the exit survey comprising 500 individuals, we asked the respondents how much time they spent on their visit to Lõunakeskus. 38% of the respondents said that they did not spend more than 15 minutes on their visit to the shopping centre. 30% estimated the duration of their visit to fall between 15 and 30 minutes and 22% spent 30 to 60 minutes at the shopping centre. Only a few of the respondents said they spent more than an hour shopping (Figure 6).

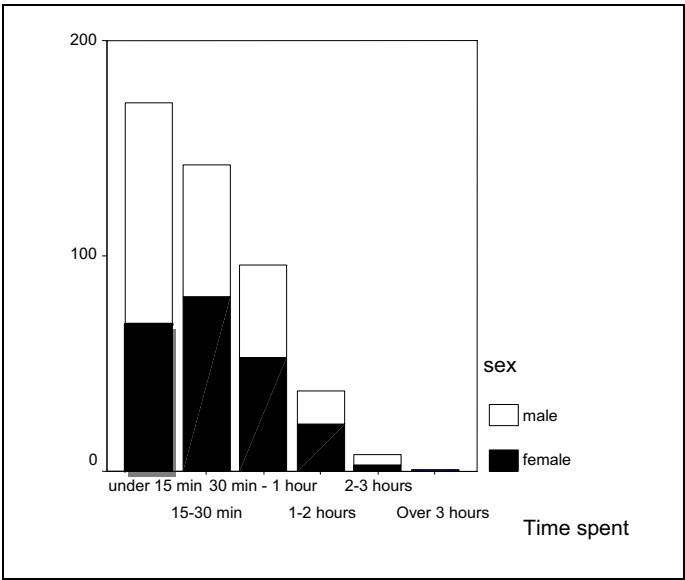


Figure 6: The distribution of the visit lengths and gender.

Duration of visits does not depend much on the weekday as the distribution of visit lengths over the week was very even. Curiously, there were significantly more customers who estimated their visit to last less than 15 minutes during the morning hours up to noon. On the other hand, those who spent more than an hour shopping mostly visited Lõunakeskus in the evening hours between 7 p.m. and

9 p.m. Thus, longer visits mostly take place after 7 p.m. There was also a significant dependence between the duration of a visit and gender ( $p=0.01$ ). We can safely say that men spend less time shopping during their visits to Lõunakeskus than women. More than 60% of men spent less than 15 minutes during their visit and only 40% of women did their shopping within 15 minutes (Figure 6). As the average length of a visit is rather short, we can surmise that traditionally closer to home services have now largely moved to shopping centres.

### 3.2 Distribution by origin and destination

More than a half of the customers came from home, 26% came from work and 21% from elsewhere. As expected, the starting location was very strongly dependent on the weekday. On the weekend, people came mostly from home and during the rest of the week; people coming from work were in a clear majority.

57% of all respondents resided in Tartu. 23% came from the closest, neighbouring zone, 18% came from the middle zone and 16.4% came from the farthest zone (periphery) on the other side of the river. When taking into account the population size of various city districts, the dependence on distance becomes quite obvious (Figure 7). It must also be pointed out that the respondents may not be aware of the official borders of the city districts.

155 respondents (31%) came from outside Tartu. 27% came both from the nearest and middle zones, 15% came from the peripheral zone. Considering the share of visitors relative to the population size of the three zones, clear dependence on distance becomes obvious. Per 1000 capita, 13.1 people come from the nearest zone, 4.1 from the middle zone and 1.6 from the peripheral zone.

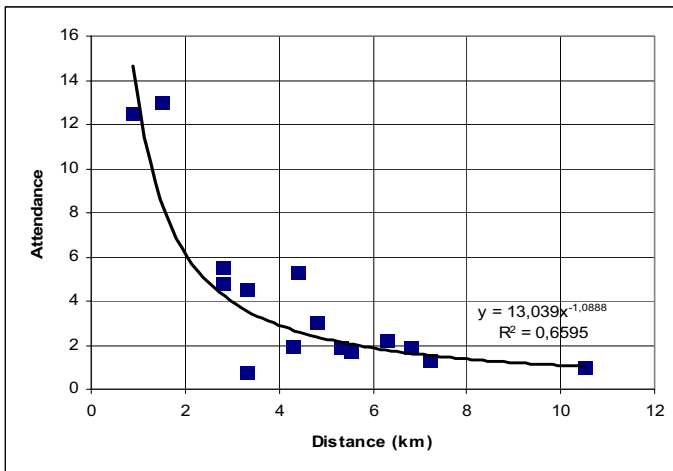


Figure 7: Relative share of visitors from different districts and the dependence on distance.

There is a very strong correlation between distance travelled and transportation mode. 89% of people from outside Tartu and 70% of local customers came by car. There is also a large statistical difference in transportation modes between the zones within the city. The largest share of car users came from the middle zone, where car use percentages were respectively 91 and 86; bus use was higher than average among the residents from the peripheral zone and most people who came on foot came from the close neighbourhood, of course.

The distance between the origin and the destination is a very important factor. In order to determine the relation between certain variables and the distance, we asked the respondents to specify the city district they were coming from, going to, and in which district they were resident. The sample comprising 500 individuals, however, is inadequate for finding statistically significant relations in the context of the present study, since the representation from smaller and more distant city districts remained rather meagre.

Upon leaving Lõunakeskus, 35% respondents also left the city of Tartu. 27% of respondents went to the nearest zone and 14% to the left bank of the River Emajõgi. Thus, the starting point and destination percentages are rather similar. If we divide the pairs of origins and destinations into separate categories on the basis of the aforementioned zones, we will see that the largest share is taken up by traffic from hinterland to hinterland (23%), of which 75% is commuting and 25% is transit traffic. Its main reason is the peripheral location of the shopping centre on the fringe of the city, which is why Lõunakeskus is very often the sole destination of the whole trip and not a stop on the road, as a small shop usually would be.

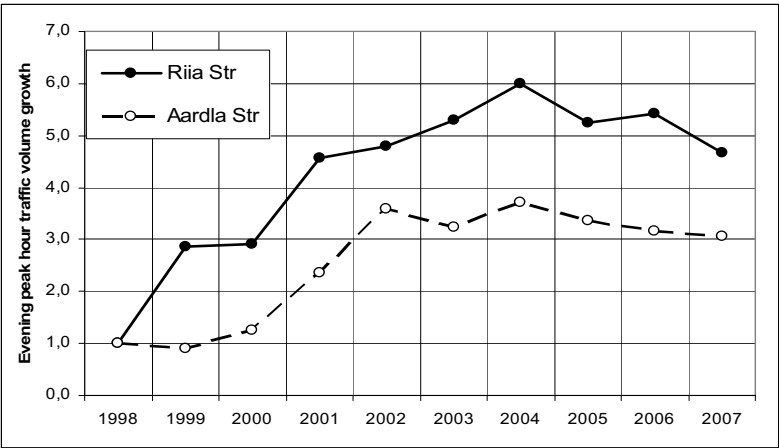


Figure 8: Traffic increase at access streets to Lõunakeskus [5].

Thus it is considered, that Lõunakeskus is also having an important role of creating significant traffic flows, at the street network located in the neighbourhood. Thus the traffic survey [5] conducted in the surroundings of





Lõunakeskus show that the share of traffic created by the visitors of the shopping centre is 72-92% of the total Ring Road traffic, where Lõunakeskus is located. The traffic flows at the two access street (connecting Lõunakeskus and the city) have increased significantly since the opening in August 2001 (Figure 8).

## 4 Summary

The concentration of service centres compels people to travel more. To reach those shopping zones, people undertake more trips and more frequently for the sole purpose of shopping.

Compared to other larger retail establishments in Tartu, Lõunakeskus is characterised by a high proportion of visitors from outside the city. Based on this fact, the share of car-using customers received by Lõunakeskus is probably higher than that of other shopping centres in Tartu. Good access by car and a spacious parking lot also attract customers not only from nearby municipalities, but also from other larger cities in Estonia. Most local customers from Tartu also arrive by car. The shopping centre thus draws most of its clientele from social classes with greater personal mobility. As a result, among customers, middle age groups prevail and there are less elderly people, who depend on bus travel.

As a surprise, the largest share of customers do not spend more than 15 minutes shopping. Besides satisfying the needs of large-scale shopping trips, Lõunakeskus also successfully provides all sorts of everyday services, which traditionally have been closer to home. Traffic generated by Lõunakeskus (and other similar shopping centres on the city fringes) is primarily characterised by there-and-back movements, where the shopping centre is the sole destination of the trip. The share of such shopping trips is increasing constantly as the retail and service centres continue to concentrate. This increases the volume of everyday traffic, which becomes very heavy on the roads.

So far there have been very few other similar customer movement studies with respect to shopping centres in Tartu and in Estonia and it is difficult to find suitable data for comparison. The concentration of retail outlets and services is not yet very widespread in Estonia and the shopping centres are just taking their first steps on the road to domination. Although Lõunakeskus and other similar large retail establishments are popular family-oriented shopping and entertainment centres, the present study also shows that they contribute to car dependency and prolong everyday trips within the city. Thus, we need to have more information on the socio-economic and environmental impacts of such retail establishments before we give a green light to their construction, since we also need to preserve and improve our everyday living environment.

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