Location choice in the greater Zurich Area – an intermediate report

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Abstract

The residential location choice constrains the household. It defines the lifestyle through the costs of the apartment and the associated mobility-modes. The location of the residence also defines the accessibility, the surrounding opportunities and thus the leisure- and social behaviour of a household. The EU project SustainCity will implement the land use model UrbanSim. A central part of this model is the residential location choice of households. UrbanSim allows modelling this one with the available data and calibrates it for the study area. For this purpose a survey on 5000 households having recently moved within the Canton of Zurich, was conducted at the end of 2010. The survey asked for attributes of the location, attributes of the current and the previous residential location, as well as aspects of the social networks and attitudes of lifestyle. Belart (2011) provides a first attempt to examine the resulting 1100 responses with the help of discrete choice models.

This paper will report on these results and describe the work currently in process to extend the analyses of this survey.

Keywords

urban simulation; spatial analyses; location-choice-models; UrbanSim, Zürich, Switzerland

1. Introduction

Within the project of SustainCity[1] the IVT is currently setting up a case study of the land-use-simulation-model "UrbanSim" for the canton of Zurich (Waddell, 2002). One of the essential models, needed to run the simulation, is the household-location-choice model, which represents the choice of households on their future residence having taken the decision to move. The modelling of this choice will be with discrete choice models (Ben-Akiva and Lerman, 1985).

Earlier work on the location choice of households for the greater Zurich area was undertaken by Bürgle (2006), within the project "Zukunft urbaner Kulturlandschaften". The results obtained in there were the basis for this paper. A new survey was undertaken in November 2010. Beside the variables already found by Bürgle, the survey elaborated the influence of the location of the workplace, the distance to member of the social network and the impact of chosen lifestyles on the location choice of households.

Although not all those attributes allow for later implementation into the modelling framework of UrbanSim, the results obtained will help to understand relevant influences that need to be modelled in the simulation process.

The paper will report on intermediate results, starting with a description of the survey and the installation of a framework for evaluation, before discussing the preliminary results of the first estimations.

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1   www.sustaincity.org

2. The survey

2.1 Content

The survey aimed for a reestimation of the models developed in the work of Bürgle (Bürgle, 2006; Löchl et al., 2007) but also for an extension of these results and evaluation of the relevance of lifestyles and social networks for the location choice of households. To do so, sets of questions were developed on the following issues:

- attributes of the household,
- attributes of the current and the previous residence
- location of members of the social network
- type of lifestyle of the household

The attributes of the household were essential in prior works and therefore were asked as in the previous survey employing the categorisations of the Swiss Microcensus. Most important aspects are the type, size and income of households as well as the availability of transport modes.

As has been already shown by Bürgle (2006)., the attributes of the residence and its location have a significant impact on the utility of it for a household. Besides the size, price and quality of an apartment that were asked in the survey, this also implements values of the location, e.g. the density of population or noise-index of the location. Those attributes were added to the responses of the survey through GIS-routines, by a post-processing work described later.

The distance to members of the social network, such as friends or family, was expected to be relevant for the residential location choice of a household. For evaluation the members of the social network, their location and the number of meetings per month have been queried in the survey. As the pretest showed, naming the members and their address lead to a lower response rate. For this reason the survey was tested into two versions: one asking for the "location of the social contact" and the other one asking for the "change of distance" that occurred through the relocation.

Another aspect that was evaluated, is the impact of different lifestyles on the location choice behaviour of households. Lifestyle-concepts have been discussed since the 1980s, being based on changes in behaviour through modernisation processes in comparison to traditional social organisation forms within the population (Beckmann et al., 2006). Although the influence of lifestyle and the chosen residential form (and location) have been reported in various studies (Walker and Li, 2007; Ær\o, 2006; Schneider and Spellerberg, 1999; Beckmann et al., 2006),

the various interpretations of lifestyles and their influences lead to a missing common definition of lifestyle-typologies (Otte, 2005). In conclusion two approaches have been tested within this survey. The first approach was developed by Otte (Otte, 2005) and defines nine lifestyles that can be evaluated through a set of 10 questions. As Otte concluded that his stated lifestyle-clusters don't give ideal results in the theme of "housing" and that they miss leisure-behaviour, an alternative approach has been developed by Belart (Belart, 2011). His approach measures stated dimensions of lifestyles and searches for clusters of lifestyles through a factor-analyse.

The results of both approaches have proofed to have an impact on the location choice of households in the work of Belart (Belart, 2011). Through the splitting of the survey to test the two versions of lifestyles, the number of observations that could be used per estimation is relatively low (n=276). The use of lifestyles in the location choice modells reduced the significance of other attributes and did not enhance the explenatory power of the models. For this reason the current work concentrates on imputation of lifestyles to merge the different versions of the survey and creates a larger dataset. The research on lifestyles done by Belart will therefore not be stated within this report.

In summary, four versions of a query have been developed for the survey, differing in the questions on lifestyles and social contacts. A calculation of the response burden according to Axhausen and Weis (2010) should give an outlook into the response rates to expect.

Table 1   Versions of the survey and the response burden

		lifestyle-items	
		according to Belart (2010)	according to Otte (2005)
detailed addresses of social contacts	*yes*	A (354)	C (330)
	no	B (344)	D (320)

2.2 Survey response

The best way to observe the household location choice would be to observe all the persons who moved into or within the Canton of Zurich during a certain timeperiod. The time periods chosen for this survey were the most recent months, here July and August 2010. As a coorperation with the Swiss Post Office was not possible, the addresses of the persons that moved had to be obtained from an address-seller that cooperates with the Swiss Post Office. This address-seller had registerd 5.254 changes of addresses within the months of July and August through matching his database with the data of the post office.

The moving of persons is registered as a change of address at the Swiss Post Office, if the person does fill out a forwarding request for a previously registered residential address located in Switzerland. Therefore not all moving persons could be reached with the survey: persons who did not fill out such a request or who lived abroad before could not be contacted. The Swiss Post Office has a total of 18.525 persons in the Canton of Zurich as having signed the forwarding request during July or August 2010. The 5.254 addresses for the survey thus represent 28.5% of the persons registered by the Swiss post, but some of the addresses obtained were not valid and the response of the survey showed, that not all of the persons contacted within the survey really moved during that time.

The statistic departmend of the canton Zurich registerd 200.000 persons that moved into or within the canton for 2009, which makes a share of approximately 16.500 per month. In conclusion it can be expected that the 4953 persons contacted within the survey represent about 15 % of the persons having moved in July and August 2010 within or into the canton of Zurich.

The survey was sent beginning of November 2010. About three weeks after having sent the survey to a person, a postcard was sent as a reminder. By December 9th, 1.039 persons had participated on the survey, of which 706 persons had moved during the expected time. This represents 2.1% of the moving persons in the canton of Zurich.

Table 2   Response behaviour per version of survey

	A	**B**	**C**	**D**
addresses that have been contacted	1'238	1'238	1'239	1'238
valid addresses	1'207	1'215	1'209	1'220
responses (until 9.12.2010)	243	269	245	282
responses (until 9.12.2010) [%]	23.4	25.9	23.6	27.1

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Figure 1   Response burden in comparison with other surveys
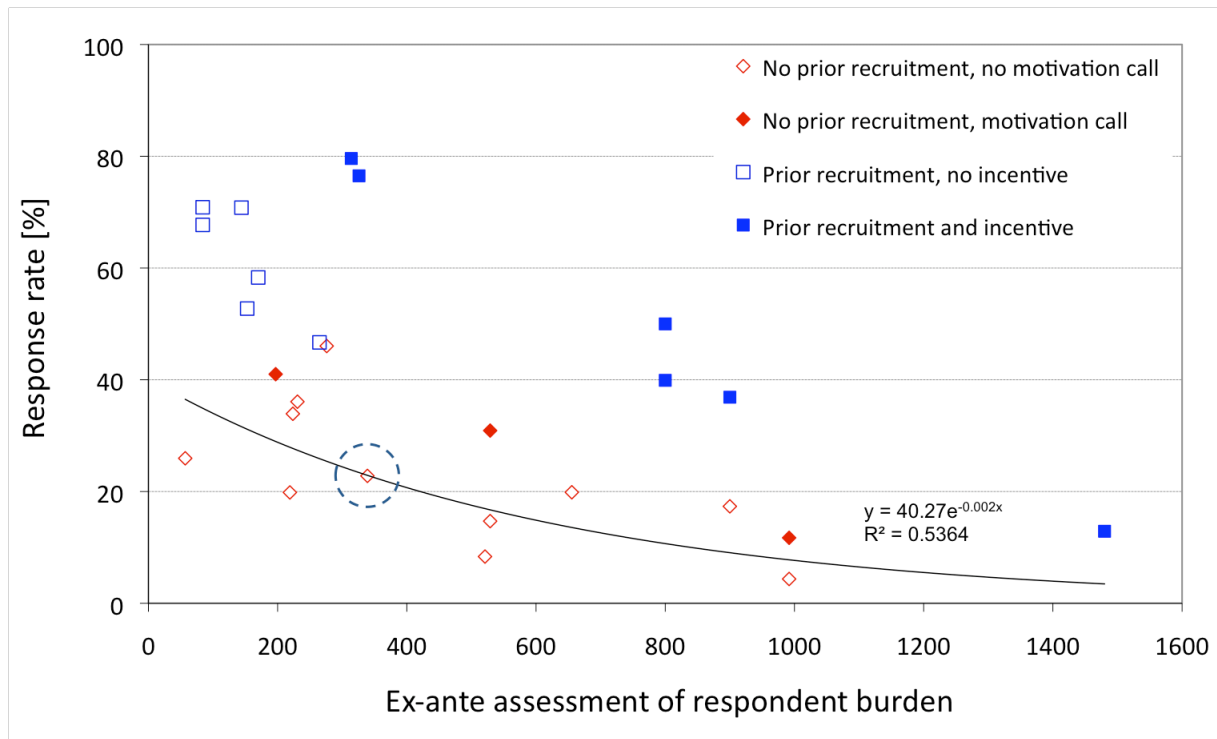
The response to the survey shows that the survey-versions asking for the addresses of the social network (see above) have been sent back less often then the ones asking for the change of distance. This matches previous expectation, that it takes more effort to ask the respondents for addresses (version B and D) than filling out a change of distance (Version A and C). It might as well evoke some privacy concerns.

2.3   Comparing the data to the microcensus

The results of the survey were compared to the microcensus of 2005. The microcensus contains 5.752 persons in 5.084 households[2] in the Canton of Zurich. Those have been weighted according to the distribution of the survey for sex, age, education and income to represent the distribution of the population in the Canton. (The detailed overview on the comparison is given in the appendix.)

The distribution of the gender has minor differences (46,2% male in the survey versus 50% in the census). Significant differences are found for age. The share of persons moving in the age

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2   Households with more than three members are represented by two respondants in the Microcensus.

between 30 and 40 is a lot higher than than in the census. This group of persons are very mobile in terms of changing residence, an observation already made in the UNIVOX-survey of -Axhausen and Beige (Axhausen et al., 2003). The share of persons with an age higher than 60 is a lot lower though. It looks like with that age moving becomes too exhausting and is avoided as long as possible.

Further comparisons concerning income and education show a high percentage of persons with a university degree or titel of master craftsman. The percentage of persons with an university-degree represent the students that finished their studies and changed residence for their first job. Meanwhile it can be expected that the number of persons with a master result from the distribution of age mentioned above. The distribution of age and education also has an effect on income. The share of high incomes is significantly higher than in the microcensus data.

In summary it can be said that the data received in the survey is a representative sample of the moving persons and showing that persons have a different probability of moving during their lifetime.

Table 3   Comparison of survey results with microcensus 2005

	Survey 2010	MZ 2005 (weigthed)	Difference	MZ 2005 (unweighted)	Difference
Gender					
male	50.0	48.7	1.3	46.1	3.9
female	50.0	51.3	-1.3	53.9	-3.9
Age					
<18	0.0	ignored		ignored	
18-30	19.2	19.6	-0.5	16.1	3.1
30-40	31.9	19.1	12.8	18.6	13.3
40-50	22.0	19.9	2.1	18.5	3.5
50-60	11.6	16.5	-5.0	16.5	-5.0
>60	15.0	24.9	-9.9	30.3	-15.3
Nationality					
Swiss	89.3	80.0	9.3	84.8	4.5
other	10.7	20.0	-9.3	15.2	-4.5
education					
Primary and secondary school	5.0	15.3	-10.3	15.3	-10.3
A-Levels (High-school graduation)	5.6	-	5.6	-	5.6
Apprenticeship	29.1	39.6	-10.5	39.6	-10.5
Master	17.8	5.4	12.4	5.4	12.4
College of education, technical college, university of applied sciences	19.6	16.3	3.3	16.3	3.3
University	18.5	8.7	9.8	8.7	9.8
Other/Missing	4.4	14.5	-10.1	14.5	-10.1
income [CHF]					
<2000	1.5	3.4	-1.9	3.3	-1.8
2000 - 3999	9.0	16.3	-7.3	15.8	-6.8
4000 – 5999	16.5	23.0	-6.5	22.1	-5.6
6000 – 7999	17.7	17.2	0.5	16.5	1.2
8000 – 9999	14.9	10.2	4.7	10.3	4.6
10000 – 11999	11.5	5.5	6.0	5.5	6.0
12000 – 13999	7.1	2.7	4.4	2.7	4.4
14000 – 15999	7.2	1.5	5.7	1.4	5.8
>16000	10.3	2.3	8.0	2.2	8.1
Residential type					
Rent	76.7	59.6	17.1	57.0	19.7
Owned appartment	22.8	39.8	-17.0	42.5	-19.7
Business appartment	0.1	0.3	-0.2	0.4	-0.3
missing	-	0.3	-0.3	0.1	-0.1
Size of Houshold					
1.0	28.3	28.8	-0.5	28.8	-0.5
2.0	41.4	36.1	5.3	36.1	5.3
3.0	14.0	13.1	0.9	13.2	0.8
4.0	11.0	15.3	-4.3	15.2	-4.2
>4	5.4	6.7	-1.3	6.7	-1.3
Type of household					
One-person	28.3	28.8	-0.5	28.8	-0.5
Two persons/couple with no childer	38.6	30.9	7.7	30.7	7.9
Single parent with children under 18	4.2	5.5	-1.3	5.7	-1.5
Family with children under 18	22.4	31.6	-9.2	31.5	-9.1
Multiple adult person household	5.4	3.2	2.2	3.2	2.2

3. Dataprocessing

3.1   Processing framework

Belart (2011) used the software SPSS to analyse and transform the data before using the choice-set-sampler (see below) to create a final dataset, which could be taken for the model estimations with biogeme[3].

The ongoing work showed that it is necessary to run this preprocessing several times and to update the data, based on the results observed in the estimated discrete choice models. An example of such a preprocessing is the integration of new variables coming from a GIS into the data or a classification of variables based on their quantiles.

It thus became necessary to create a generic framework, i.e. a workflow that allows easy changes of the data, the choice-set-sampling and the estimation. This framework will also be essential for testing various configurations of the choice-set-sampling in the ongoing work.

The data processing for UrbanSim is done with PostgreSQL (for the Zurich case study of SustainCity). For consistence and later implementation into the UrbanSim-processes, PostgreSQL was chosen as database for this generic workflow as well. Transformation of the data could then be scripted in PostgreSQL or in the statistic software 'R' through linking R to PostgreSQL. These scripts also include renamings of variables to fit the dat-file to the previous models of Bürgle or Belart and to use the choice-set-sampler without any major changes. This choice-set-sampler is linked to PostgreSQL and creates a '.dat'-file as data for biogeme.

Besides this preprocessing also postprocessing is needed, e.g. for the calculation of distances from an alternative to a workplace that vary for each alternative. These alternative-specific variables are created and calculated as expressions directly within the software Biogeme. A future step will be to include the GIS-based calculations (see below) into this generic framework as well. This has has not been realized yet.

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3   http://biogeme.epfl.ch/

3.2   GIS enriching

Besides the variables that could be obtained directly through the survey, additional information on the location was added later to the data. This demanded geolocating the addresses of the current and previous residences as well as the workplaces of all the household members and the social contacts. Within the current work of SustainCity, geocoding of addresses is based on cadastral information. As these were not available at the time of the survey, the geocoding of the survey data was done with Google-maps.

Based on the coordinates a spatial join in GIS allowed enriching the survey data with additional information. At first already available information from the prior works of Bürgle and Löchl were used. These data had the scale of the hectare grid and were joined to the parcels of the cadastral data via the centroid of each parcel. As the the data is not representing the year 2010, these variables were created again with the newest available data whenever possible.

The process of deviation was scripted in GRASS-GIS, to allow for later implementation into the dataprocessing-structure of the SustainCity Zurich case study. In total more then 90 additional variables could be included into the basis data. The table below gives an overview of the most important variables included.

Table 4   Overview of additional variables through GIS enriching

Variablename	Reference year	Scale	Unit	Type
Aggregated variables				
Tax income of municipality per resident/1000	2006	municipality	1000CHF/Pers	float
Tax index of municipality	2006	municipality	-	float
Rent vacancy rate in municipality	2006	municipality	%	float
Share of persons with university degree in municipality	2006	municipality	%	float
Portion of buildings build before 1971	2006	municipality	%	float
Inhabitants in Municipality	2006	municipality	-	integer
Portion of retired persons	2006	municipality	%	float
Percentage of "foreigners" (foreign language as mother language)	2006	municipality	%	float
Location variables				
Mean sunshine index (mean of nine points of time per year)	2006	gridcell 100mx100m	-	float
Slope	2006	gridcell 100mx100m	%	float
(Ln) Euclidean distance to next highway accesspoint	2010	centroid of parcel [m]	meter	float
(Ln) Euclidean distance to next station	2010	network-axes	meter	float
Euclidean distance to highway is smaller than 100m	2010	centroid of parcel [m]	-	boolean
Euclidean distance to railways is smaller than 50m	2010	network-axes	-	boolean
Distance to primaryschool	2010	centroid of gridcell100x100m	meter	float
Distance to CBD Zürich	2010	centroid of gridcell100x100m	meter	float
Distance to CBD Winterthur	2010		meter	float
Distance to closest kindergarten	2010		meter	float
Distance to power line	2010		meter	float
Distance to lake	2010		meter	float
Distance to shopping_facility	2010	centroid of gridcell100mx100m	meter	float
aircraft noise	2009			
Households of size 'X' in radius of 1km (X=[1:10])	2000	gridcell 100x100m	sum/hh	integer
Density of children (per ha in radius of 500m)	2000	gridcell 100x100m	pers/ha	float
Density of Population (per ha in 1km radius)	2000	gridcell 100x100m	pers/ha	float
Density of open space (per ha in radius of 2km)	2000	gridcell 100x100m	sqm	float
Density of jobs (jobs in retail trade, per ha in 1km radius)	2006	gridcell 100x100m	jobs/ha	float
Density of jobs (jobs in hotel and catering industry;amount in 1km radius)	2006	gridcell 100x100m	jobs/ha	float
Travel time to Bürkliplatz (car travel-time, regional transport model)	2008	link (matsim)	min	float
Travel time to Bürkliplatz (public transport)	2008	link (matsim)	min	float
Public transport accessibility (based on regional transport model)	2005	zone	-	float
Private vehicular traffic accessibility	2005	zone	-	float

3.3   Missing values, weigthing and imputation

Not all items of the survey were filled out completely. To have a maximum of data for the estimation, the missing data have been imputed where possible based on the observed data. This especially had to be done for the calculation of the gross prices or net prices, through using the mean value of running costs per residential space (n=282, mean=2.415 CHF/m²) as well as for the costs of parking spaces (inside parking: n=215, mean=134.80 CHF; outside parking: n=76, mean=56,10 CHF). Residential costs that were not defined as gross or net prices were expected to represent gross prices, as this are the prices paid monthly and therefore are likely to be more present in the mind of the respondant.

The comparison of the non-chosen alternatives (see below) with the chosen alternatives showed a significant difference in the average price of the offers. The average rent price is 25,74CHF/sqm (15.5% higher then the observed rent prices), average sale-price is 7.550 CHF/sqm (16.5% higher then observations in the survey). The online offers are expected to represent maximum prices in the Canton of Zurich, not necessarily representing the price people are willing to pay. To avoid a bias in the first estimations, the price of non-chosen alternatives thus have been scaled with a factor according to the observed mean prices. This aspect will be analysed more in detail in near future, as the search mode has been asked within the survey as well.

As mentioned above, different versions of the survey have been used. In 50% of the survey the change of distance to social contacts (that occurred through moving) was asked instead of the precise address of the social contacts. The first estimate showed that the distance to members of the social network is a significant variable, but could only be estimated with 50% of the observations because of the versions used in the survey. An approach that was tested for the imputation of this distance. As the distance is calculated individually for each alternative (within the estimation), it was necessary to compute an artificial geolocation of the social contacts, based on the stated change of distance and the residential location before and after moving. This was done in R by creating the intersection of two circles around the residential locations one with the mean distance and the other one with the change of distance. One of the resulting two intersection points could randomly be chosen as location of friends.

3.4   Choice-set-sampling

The discrete choice models demand for a choice-set representing the alternatives available when the decision maker made his choice. As the survey was realized within the Canton of Zurich the set of non-chosen alternatives would have to represent available offers in the same area.

These non-chosen alternatives were created based on offers available at a relevant website. A parser registered offers that were online during the same time-period as the survey took place. This allowed the creation of 3.892 alternatives for rented residences and 1.647 alternatives offered for sale. These alternatives were geocoded and enriched with the same information as the chosen alternatives (see above).

Ideally the estimation should take into account all the available alternatives for each observation. As this becomes a technical problem with large data-sets, choice-set-sampling is a common approach to reduce the number of alternatives. A choice-set sampler that has already been described by Bürgle (2006) was used to create a dataset of 50 alternatives for each observation, representing the chosen alternative and 49 non-chosen ones. The output is a '.dat'-file that can then be used as basis for the estimation in the software "Biogeme".

The sampler chooses a non-chosen alternative for each chosen alternative based on a condition that is set by the user. An example for such a condition will be the distance of a non-chosen alternative to a chosen alternative. As Ben-Akiva and Lerman report (Ben-Akiva and Lerman, 1985) this kind of 'stratified importance sampling' has a significant effect on the results of the discrete choice-models and demands for correction. The first estimations described within this report, have therefore been created based on a simple random sampling, i.e the non-chosen alternative is chosen by random. Ongoing work will evaluate the effect of changes in the sampling strategy.

4.   Location choice models

4.1   Hypothesis

Discrete base models are based on the assumption that the observed choice (chosen alternative) is a function of the decision makers socioeconomic characteristics and the relative utility of the alternative (Ortúzar and Willumsen 2001, p.220), which again can be seen as a combination of attractiveness of the attributes of the alternative and the attributes of its surrounding location.

Based on the available data the following hypothesis could be expressed in addition to previous expectations of Bürgle. These will be tested within the discrete choice models described lateron.

- Households tend to search residential locations close to the members of their social network
- Households with employed persons prefer housing locations close to each of the places of employments

Table 5   Overview model R1

$V(j) =$	$\beta_{ratio\ rent/income}$ * *ratio rent/income*
+	$\beta_{net\text{-}area/sqrt(housholdmembers)}$ * *net-area/sqrt(housholdmembers)*
+	$\beta_{distance\ to\ workplace}$ * *distance to workplace in km* $^{exponent\ distance\ to\ workplace}$
+	$\beta_{TT\ to\ Bürkliplatz\ by\ car}$ * *traveltime (by car) to Bürkliplatz in min*
+	$\beta_{accessibility\ of\ PT}$ * *log(accessibility of PT) * dummy „no car"*
+	$\beta_{households\ of\ same\ size}$ * *households of same size in 1km radius*
+	$\beta_{populationdensity}$ * *population density (r=1km) * dummy „young household"*
+	$\beta_{density\ of\ children}$ * *density of children (r=500m)* dummy „household w. children"(<12year)*
+	β_{noise} * *dummy „close to highway or railway"*
+	$\beta_{taxindes}$ * *Taxindex of municipality*
+	$\beta_{rent\ vacancy}$ * *rent vacancy in municipality*

n=683; ρ^2 =0.1117

4.2   Rented residences

4.2.1   Reference model

The work of Bürgle (2006) could be used as reference for the residential location choice behaviour in Zurich. This work shows that location choice behaviour of households vary for rented residences and owned locations. Here only the location choice for the rental market will be analysed. To do so the final models developed by Bürgle for the rental market have been re-estimated as basis for the extensions described here (model R1). For detailed descriptions on assumptions and explanations please refer to Bürgle (2006).

Table 6   Comparison of results model R1

	Bürgle 2006		Survey 2010		
Variable	β	*β(i)/* *β(rent/inc)*	β		*β(i)/* *β(rent/inc)*
Ratio rent/income	-2.159	-	-3.880		-
Floorpace divided by square root of household size	0.006	*-0.003*	0.004		*-0.001*
Distance to workplace [km]	-4.302	*1.993*	-1.850		*0.477*
Exponent of distance to workplace	0.201	*-0.093*	0.308		*-0.079*
Traveltime to Bürkliplatz in min (by car)	0.053	*-0.025*	0.013		*-0.003*
Ln of accessibility to population by public transport * no car dummy	0.550	*-0.255*	0.508		*-0.131*
Population density * young household dummy	0.006	*-0.003*	0.014		*-0.004*
Density of children * family with young children dummy	0.042	*-0.019*	0.000	***	*0.000*
Proximity to major roads or high railway noise level	-0.177	*0.082*	0.302		*-0.078*
Rental vacancy of municipality	-0.162	*0.075*	-0.103		*0.027*
Tax index of municipality	-0.028	*0.013*	0.000	***	*0.000*
Number of observations	*878*		*683*		
ρ2	*0.190*		*0.112*		

(***)= not significant on 95% interval of confidence

Comparing the overal model fit shows that the estimates with the new survey has a lower explenatory power then the estimation of Bürgle. As not all the data enriched in GIS are of current date this is not very surprising. But as most of the esimtation parameters have the same sign and relative value, the model can be used as a basis for the ongoing work.

The sign of the variable "Proximity to major roads or high railway noise level" and the "tax-index", of which the second is not significant. Those changes are expected due to the very low vacancy rate in the city of Zurich and thus the low share of alternatives available within the city.

Also the variable "density of children" has a different sign as in previous estimate and as expected. A possible explanation might be that all variables on population that has been added via GIS (see above) had to be derived from the population-census 2000 as no other data was available in the detail needed. The distribution of young families since has changed significantly and children of that time year are grown-ups nowadays.

For the reference model as basis for further estimations these variables were therefore removed. Some additional changes were done to enhance the significance of the estimated parameters and the model-fit in this reference model. Those are the replacement of absolute numbers of "households of same size in 1km radius" through a relative share of those households in percent and the transformation of the "net-area per household-member" to a logarithmic expression to reduce the effect of marginal utility differences. Finally also the "accessibility for private vehicular transport (PTV)" has been integrated to be consistent with the evaluation of public transport accessibility. This variable was not integrated in the previous models of Bürgle as the region of observation was smaller and very urbanised, so that no big differences in car-accessibility were expected. As the study area is now extended to the whole canton of Zurich, the differences are expected to be big enough to become relevant.

All those changes formed the reference model R2 as basis for the model extensions.

Table 7   Results model R2 (reference model)

Parameter	β	t-test	p-value
ratio rent/income	-5.43	-11.21	0.00
log(net-area per household-member)	0.94	7.97	0.00
distance to workplace [km]	-2.05	-2.55	0.01
exponent of distance to workplace	0.29	3.91	0.00
traveltime (by car) to Bürkliplatz in min	0.01	2.49	0.01
log(accessibility of PT[4]) * dummy „no car"	0.46	4.44	0.00
log(accessibility of PVT[5]) * dummy „car available"	-0.23	-3.12	0.00
portion of households of same size (r=1km)	0.01	1.61	0.11
population density in r=1km [Personen/ha]	0.01	4.76	0.00
rent vacancy in municipality	-0.12	-2.38	0.02
number of obsercations			*683*
LL(0)			*-2671.90*
LL(max)			*-2342.50*
ρ^2			0.123

4.2.2   Extended model

Based on this reference model further variables were included stepwise to test if they add explanatory power. These model extensions were tested with different version of data sets: Through changing the seed within the choice-sampler-random-process, it was possible to create different variations of non-chosen alternatives and test the stability of the estimated parameters.

A first assumption was that the distance to workplace is not only relevant for the person answering the survey, but for all the household-members with employment. In the first estimates (model R4) this enhanced the model quality and was significant.. Further tests have

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4   PT=public transport

5   PVT=private vehicular traffic

been done on weighting the distance through the share of employment, but that did not improve the better results (model R5). The estimation of model R4 still shows a negative effect of the distance to workplace, but in comparison to model R2 the exponent is bigger and the base-value is a bit smaller now. In overall the negeative effect thus stays the same but the higher explanatory power of the model supports the hypothesis, that all members of a household that do have an employment want to live close to that place of work (model R4).

Table 8   Interaction term modell R4

$V(j) = ... + \beta_{Distance\ to\ workplace} * $ *Average distance to work of all household members* $^{Exponent\ distance\ to\ workplace} + ...$

Another expectation is that the distance to social contacts has an impact on the residential location choice of households: People want to live close to their family or friends and eventually also have a better chance to find an appartment in theri neighborhood through their personal contacts. This has been tested through calculating an average distance to all the social contacts and in a second test through weighting the distance to each contact with the number of meetings per month (model R7).

Table 8   Interaction term modell R7

$V(j) = ... + \beta_{Distance\ to\ social\ contact} * $ *Weighted average distance to social contact* $^{Exponent\ distance\ to\ social\ contact} + ...$

Both approaches show that the expectation is correct and that the parameter is both negativ and large.. Best results were optained with the model R7. The overal model fit rises significantly and shows an impact of the variable that is higher than the distance to work, but the basis-parameter of the expression is not highly significant (p=0.06). This might result of the fact that only 276 observations have been reported on the distance to social contacts (see survey versions).

A test on running the same model on only those 276 observations rises the overall fit to 0.315, but reduced the significance of most variables to a critical level, as the number of observations is not enough. Current work is therefore aiming for computing the distance to social contacts through imputation based on the change of distance. As the current results of this approach don't give any reasonable results yet, they will not be reported here.

The results of the stepwise extensions has been summarized into the model R11.

Table 10   Final model with all extensions (R11)

Parameter	β	t-test	p-value
ratio rent/income	-5.510	-11.070	0.00
log(net-area per household-member)	0.982	8.010	0.00
distance to workplace [km]	-1.590	-2.760	0.01
Distance to social contacts	-8.160	-1.810	0.07
Exponent of distance to workplace	0.374	4.720	0.00
Exponent of distance to social contacts	0.223	2.660	0.01
portion of households of same size (r=1km)	0.016	1.770	0.08
traveltime (by car) to Bürkliplatz in min	0.020	4.380	0.00
log(accessibility of PT[6]) * dummy „no car"	0.410	3.770	0.00
log(accessibility of PVT[7]) * dummy „car available"	-0.298	-3.990	0.00
population density in r=1km [Personen/ha]	0.010	4.370	0.00
rent vacancy in municipality	-0.106	0.052	0.04
number of obsercations			683
ρ^2			*0.2128*

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6   PT=public transport

7   PVT=private vehicular traffic

5.   Summary and conclusions for work on SustainCity

The paper describes the initial survey and settings, that have been used to run some first estimates on location choice behaviour in the Canton of Zurich. The approach using PostgreSQL as database forms a generic workflow that allows for future implementation into the work of SustainCity.

For all the first estimates, the results of Bürgle could successfully be reestimated. The extensions of those models have already been performed within the work of Belart and could as well be estimated a second time. These estimates show the importance of the distance to members of the social network and the distance to the workplace of all the household members for the rent dwellings. This shows the relevance of a the demographic model within the simulation process, that reproduces changes in the household and spatial distributions of family-members and of social network members.

The promising results will be the basis for future location choice models, focusing on the implementation of additional location attributes. To do so will demand the merging of the survey responses through imputation. First tests on this have been done, but have not given any successful results yet.

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7. Appendix

Table 11   Overview response behaviour

	A	B	C	D
Addresses that have been contacted	1'238	1'238	1'239	1'238
Address not existing	19	10	18	8
Move away/currently abroad	3	5	7	2
Person died	3	1	3	4
Person can't participate	5	1	1	2
Other reason[8]	1	5	1	0
Household received more than one survey	0	1	0	2
Valid addresses	1'207	1'215	1'209	1'220
Responses (until 9.12.2010)	243	269	245	282
Responses (until 9.12.2010) [%]	20.1	22.1	20.3	23.1
Responses (until 25.1.2011)	263	286	257	302
Responses (until 25.1.2011) [%]	21.8	23.5	21.3	24.8

8This contains addresses that do not represent a residential locations or letter boxes that have not been emptied.

Figure 2   Survey questionnaire _____

Fragebogen zur Wohnstandort-
wahl von Privathaushalten

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

IVT Institut für Verkehrsplanung und Transportsysteme
Institute for Transport Planning and Systems

| Fragebogennummer: | |
| Zugangsschlüssel: | |

Informationen zu diesem Fragebogen

Der Fragebogen besteht aus drei thematischen Blöcken:
- Im ersten Teil befragen wir Sie zu den Eigenschaften Ihres Haushaltes und der darin lebenden Personen.
- Der zweite Teil behandelt Ihre Wohnsituation, wobei die Eigenschaften Ihrer derzeitigen Wohnung/Liegenschaft im Zentrum stehen, aber auch Aspekte Ihrer Wohnungssuche und die Adresse Ihrer letzten Wohnung abgefragt werden.
- Der dritte Teil beinhaltet schlussendlich einige Fragen zu Ihrem Lebensstil.

Für Rückfragen wenden Sie sich bitte an:

Herrn Benjamin Belart, c/o Patrick Schirmer, Institut für Verkehrsplanung und Transportsysteme (IVT)

ETH Hönggerberg, HIL F32.2, Wolfgang-Pauli-Str. 15, 8093 Zürich

Telefon: 078 829 40 73, E-Mail: wohnstandortwahl@ivt.baug.ethz.ch

Teil 1: Fragen zu Ihrem Haushalt

1.1: Bitte geben Sie Ihre Wohnadresse an.

| Strasse/Hausnummer | |
| Postleitzahl | Ort |

1.2: Wie viele Personen, inklusive Ihrer selbst, leben in Ihrem Haushalt*?

Insgesamt		Personen	(* Ein Haushalt ist eine Gruppe von Personen, die in der Regel zusammen wohnen, d.h. ein gemeinsames Wohn- objekt teilen)
davon als Wochenaufenthalter		Personen	
davon in der Regel nur am Wochenende		Personen	

1.3: In welchem Jahr sind Sie geboren?

Jahr

1.4: Sind Sie…

☐ männlich   ☐ weiblich

1.5: Welcher ist Ihr Zivilstand?

☐ ledig   ☐ verheiratet   ☐ verheiratet, in Trennung lebend
☐ eingetragene Partnerschaft   ☐ geschieden   ☐ verwitwet

1.6: Welche ist Ihre Nationalität?

☐ Schweizer/Schweizerin
☐ von anderer Nationalität, und zwar:

1

Fragen zu Ihrem Haushalt
_____

1.7: Seit wann leben Sie in der Schweiz?

Jahr [   ]   ☐ seit meiner Geburt

1.8: Sind Sie…

☐ Vollzeit berufstätig   ☐ auf Arbeitssuche   ☐ andere Situation (z.B. chronisch krank)

☐ Teilzeit berufstätig   ☐ Hausmann/Hausfrau

☐ in Ausbildung   ☐ Rentner/Rentnerin (AHV/IV)

WENN SIE BERUFSTÄTIG SIND... (sonst weiter mit 1.10)

1.9.1: Wie hoch ist das Pensum Ihrer Berufstätigkeit?

[   ] %

1.9.2: Wo arbeiten Sie zum überwiegenden Teil?

☐ an einem festen Arbeitsplatz ausser Haus

Strasse/Hausnum-mer [   ]

Postleitzahl [   ]   Ort [   ]

☐ an ständig wechselnden Orten/im Aussendienst

☐ an einem Arbeitsplatz zuhause

1.9.3: Welche ist Ihre berufliche Stellung?

☐ selbständig/freierwerbend   ☐ angestellt im mittleren und unteren Kader

☐ Lohnempfänger und gleichzeitig (Mit-)Besitzer des Betriebes   ☐ angestellt in anderer Funktion

☐ angestellt im höheren Kader   ☐ Anderes

1.9.4: Wie sieht es bei Ihnen mit den Arbeitszeiten aus?

☐ fix festgelegte Zeiten für Arbeitsbeginn und/oder -ende   ☐ vorgeschriebene Wochen-, Monats- oder Jahresarbeitszeit

☐ feste Blockzeiten   ☐ total flexible Arbeitszeiten

1.9.5: Haben Sie in Ihrem Beruf unregelmässige Arbeitszeiten (Abend- und Nachteinsätze, Schichtarbeit, Pikettdienste)?

☐ ja

☐ nein

1.10: Was ist Ihr höchster Ausbildungsabschluss?

☐ keiner	☐ Höhere Berufsbildung (Eidg. Fachausweis/Diplom, Meisterprüfung)
☐ Primarschule / Grundschule	☐ Fachhochschule, Pädagogische Hochschule, Technikerschule
☐ Real- oder Sekundarschule	☐ Universität
☐ Maturität / Fachmittelschulabschluss	☐ anderer, und zwar: [ ]
☐ Lehrabschluss	

1.11: Wie viele Fahrzeuge gibt es in Ihrem Haushalt?

[ ]	Velos (fahrtüchtig)	☐ keine	[ ]	Kleinmotorräder bis 125 ccm	☐
[ ]	Autos	☐ keine	[ ]	Motorräder ab 125 ccm	☐

1.12: Wie hoch ist das gesamte Brutto-Einkommen Ihres Haushaltes pro Monat?

☐ unter 2000 Fr.	☐ 10000 bis 11 999 Fr.
☐ 2000 bis 3999 Fr.	☐ 12000 bis 13 999 Fr.
☐ 4000 bis 5999 Fr.	☐ 14000 bis 15 999 Fr.
☐ 6000 bis 7999 Fr.	☐ 16000 bis 17 999 Fr.
☐ 8000 bis 9999 Fr.	☐ 18000 Fr. oder mehr

Fragen zu Ihrem Haushalt

1.13.1: Bitte geben Sie für jede Person in Ihrem Haushalt Geburtsjahr, Geschlecht, die Art Ihres Verhältnisses und den Besitz von Auto-Führerausweis sowie ÖV-Abonnementen an.

Person	Geburtsjahr	Geschlecht		Art des Beziehungsverhältnisses			besitzt...			
		m	w	Ehe-/ Lebens- partner	Elternteil, Kind oder Geschwister	anderes Verhältnis	Auto- Führer- ausweis	General- Abon- nement	Halbtax- Abon- nement	anderes ÖV-Abon- nement
Sie selbst	____						☐	☐	☐	☐
2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

1.13.2: Bitte geben Sie für jede Person in Ihrem Haushalt den Arbeits- bzw. Ausbildungsort sowie Stellenprozent der Arbeit bzw. Ausbildung an.

Person	Arbeits- bzw. Ausbildungsort *(trifft beides zu, bitte den für Sie wichtigeren Ort angeben)*				Stellen- prozent
	momentan keiner	Ort	PLZ	Adresse (möglichst Strasse und Hausnummer, alternativ Firmenname oder ÖV-Haltestelle)	
Sie selbst	☐	B E R E I T S	B E A	N T W O R T E T	____ %
2	☐				%
3	☐				%
4	☐				%
5	☐				%
6	☐				%
7	☐				%
8	☐				%

4

Hintergrund der Fragen auf dieser Seite

Es ist anzunehmen, dass die Art und die Verteilung der sozialen Kontakte die Wohnstandortwahl beeinflussen. Um diesen Einfluss zu erkunden, bitten wir Sie, die folgenden Fragen zu Ihren wichtigsten sozialen Kontakten, mit denen Sie Ihre Freizeit verbringen, zu beantworten. Falls Sie kürzlich umgezogen sind, bitten wir Sie, auch Kontakte anzugeben, die Sie bereits vor dem Umzug gepflegt haben.

1.14.1: Bitte geben Sie für die fünf sozialen <u>Kontakte ausserhalb Ihres Haushaltes, mit denen Sie am meisten Freizeit verbringen</u>, Geburtsjahr, Geschlecht und die Art Ihres Verhältnisses an.

Person	Geburtsjahr	Geschlecht		Art des Beziehungsverhältnisses			
		m	w	Ehe-/Leben-spartner	Verwandter 1. Grades (Elternteil, Kind, Geschwister)	sonstiger Verwandter	anderes Verhältnis
1	☐	☐	☐	☐	☐	☐	☐
2	☐	☐	☐	☐	☐	☐	☐
3	☐	☐	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐	☐	☐
5	☐	☐	☐	☐	☐	☐	☐

1.14.2: Bitte geben Sie für die fünf sozialen <u>Kontakte ausserhalb Ihres Haushaltes, mit denen Sie am meisten Freizeit verbringen</u>, den Wohnort und die Anzahl der Treffen pro Monat an.

Person	Wohnort			Treffen pro Monat
	Ort	PLZ	Adresse (möglichst Strasse und Hausnummer, alternativ ÖV-Haltestelle oder Stadtkreis)	
1				
2				
3				
4				
5				

Teil 2: Fragen zu Ihrer Wohnsituation

2.1: Bitte geben Sie die Anzahl der bewohnbaren Zimmer in Ihrer Wohnung/Ihrem Haus an (ohne Küche, Bad/WC, Keller etc.).

Zimmer

2.2: Wie gross ist die Nettowohnfläche* Ihrer Wohnung/Ihres Hauses?

m² (genau)

m² (geschätzt)

(* Zur Nettowohnfläche gehören alle beheizten Flächen der Wohnung ab einer Höhe von 1.5 m, also auch interne Treppen. Nicht zur Nettowohnfläche gehören unbeheizte Keller- und Dachräume, Innen- und Aussenwände, Terrassen und Balkone.)

2.3: Bitte geben Sie die Anzahl der Nass-zellen (Badezimmer und separate WC) an.

Nasszellen

2.4: Bitte geben Sie die Anzahl der Balkone an.

Balkone

2.5: Wie viele Parkplätze gehören direkt zu Ihrer Wohnung?

☐ keine

Parkplätze in Garage

reservierte Parkplätze im Freien oder gedeckt

2.6: Verfügt Ihre Wohnung/Ihr Haus über…

einen eigenen Garten	☐ ja	☐ nein
einen Gartensitzplatz	☐ ja	☐ nein
eine eigene Terrasse	☐ ja	☐ nein
einen Lift	☐ ja	☐ nein
grüne Technologie (z.B. MINERGIE-Standard, Wärmepumpe, Solarkollektoren o.ä.)	☐ ja	☐ nein

2.7: In was für einem Gebäude leben Sie?

☐ Mehrfamilienhaus mit mehr als 6 Wohnungen	☐ freistehendes Einfamilienhaus
☐ Mehrfamilienhaus mit bis zu 6 Wohnungen	☐ Wohn- und Geschäftshaus
☐ Reihenhaus/Doppelhaushälfte	☐ Sonstiges

2.8: In welchem Jahr wurde das Gebäude, in dem Sie wohnen, gebaut? Und wann fand die letzte Innenrenovation statt?

Baujahr Gebäude	☐	genau	Letzte Innenrenovation	☐	genau
	☐	geschätzt		☐	geschätzt
	☐ weiss nicht			☐ bisher keine
				☐ weiss nicht

WENN SIE IN EINEM MEHRFAMILIENHAUS WOHNEN… (sonst weiter mit 2.10)

2.9.1: In welchem Stockwerk wohnen Sie?

☐ Parterre/Hochparterre/Erdgeschoss

im ☐ . Stock

2.9.2: Ist Ihre Wohnung ein(e)...

Maisonnettewohnung	(geht über mehrere Stockwerke)	☐ ja	☐ nein
Loft	(ehemalige Fabrikhalle oder Ähnliches)	☐ ja	☐ nein
Attikawohnung/Penthouse	(im Dachgeschoss, mit Dachterrasse)	☐ ja	☐ nein
Dachwohnung	(mit abgeschrägten Wänden)	☐ ja	☐ nein
normale Etagenwohnung		☐ ja	☐ nein
Alterswohnung	(eigens dafür konzipiert, evtl. mit Betreuung)	☐ ja	☐ nein

---

2.10: Wie schätzen Sie den baulichen Zustand Ihrer Wohnung/Ihres Hauses ein?

☐ sehr abgenutzt	(viele Mängel)
☐ abgenutzt	(einige Mängel)
☐ gut erhalten	(leichte Gebrauchsspuren)
☐ sehr gut erhalten	(fast keine Gebrauchsspuren)
☐ neuwertig	(vor kurzem gebaut oder umgebaut)

2.11: Wie schätzen Sie die Ausstattung Ihrer Wohnung/Ihres Hauses ein?

☐ einfach	(z.B. alte Elektroinstallationen, keine Mischbatterien, Küche ohne Abzug, schlechte Heizung)
☐ eher einfach	(z.B. traditioneller oder freistehender Herd, nur wenige moderne Geräte, Laminatboden)
☐ normal	(z.B. Küche mit Geschirrspüler und Glaskeramik, Radiatoren in den Zimmern einzeln regulierbar)
☐ gehoben	(z.B. Bad mit Komfortdusche und Bodenheizung, Holzparkettboden)
☐ luxuriös	(z.B. Bad mit Whirlpool und Sauna, modernste Küche, erlesene Steinabdeckungen oder -böden)

Fragen zu Ihrer Wohnsituation

2.12: Bitte geben Sie die Adresse Ihrer letzten Wohnung/Ihres letzten Hauses an.

Strasse/Hausnummer	
Postleitzahl	Ort

2.13: Aus welchem Grund sind Sie in Ihre aktuelle Wohnung/Liegenschaft gezogen?

☐ Beziehung (Trennung oder Zusammenzug) ☐ Familie (Geburt oder Auszug von Kind(ern) etc.)

☐ Beruf/Arbeitsstelle ☐ Eigenschaften der alten Wohnung/Liegenschaft

☐ Kauf von Wohneigentum ☐ anderer Grund:

2.14: Wie setzte sich der Haushalt in der letzten Wohnung/im letzten Haus zusammen, wie gross war diese Wohnung/dieses Haus und wie hoch die Wohnkosten?

Anzahl der Haushaltsmitglieder		Personen
Anzahl bewohnbare Zimmer (ohne Küche, Bad/WC, Keller etc.)		Zimmer
Monatsmiete mit Nebenkosten (falls Wohnung/Haus gemietet)		Fr.
Eigenmietwert gemäss Steuererklärung (falls Wohnung/Haus besessen)		Fr.
Verkaufspreis (falls Wohnung/Haus besessen)		Fr.

2.15: Auf welchem Weg sind Sie zu Ihrer jetzigen Wohnung/Liegenschaft gekommen?

☐ Suche im Internet ☐ über einen beauftragten Makler

☐ Suche in gedruckten Anzeigen ☐ Wohnung/Haus als Teil eines Stellenangebots

☐ über einen persönlichen Kontakt ☐ Reaktion auf Werbe- bzw. Verkaufstafel

2.16: Wie gross war das Gebiet, in dem Sie gesucht haben?

☐ beschränkt auf derzeitige Wohngemeinde
☐ lokal begrenzt (derzeitige Wohngemeinde und Nachbargemeinden)
☐ regional begrenzt (z.B. Zürcher Oberland, Zürcher Weinland, Knonauer Amt, Limmattal, Region Winterthur)
☐ gesamter Kanton Zürich

2.17: Wieviel Zeit stand Ihnen für die Wohnungs- bzw. Haussuche zur Verfügung?

☐ weniger als drei Wochen
☐ zwischen drei Wochen und zwei Monaten
☐ mehr als zwei Monate oder kein Zeitdruck

xxx

2.18: Wie lange gedenken Sie in der jetzigen Wohnung/Liegenschaft zu bleiben?

☐ langfristig (>8 Jahre), dauerhafte Bindung an diesem Ort beabsichtigt

☐ langfristig (>8 Jahre), zukünftiger Umzug aber wahrscheinlich oder sicher

☐ mittelfristig (3-8 Jahre)

☐ kurzfristig (1-3 Jahre)

☐ sehr kurzfristig (<1 Jahr), Wohnung/Liegenschaft als Durchgangsstation

2.19: Mieten oder besitzen Sie Ihre jetzige Wohnung/Ihr Haus?

☐ Miete

☐ Eigentum/Eigentumswohnung (Stockwerkeigentum)

☐ Dienst- oder Freiwohnung

FÜR MIETER (sonst weiter mit 2.21)

2.20.1: Wie viel bezahlen Sie für Ihre Wohnung/Ihr Haus pro Monat?

Monatsmiete [_____] Fr. pro Monat

Parkplatzkosten [_____] Fr. pro Monat

☐ Parkplatzkosten unbekannt

Nebenkosten* [_____] Fr. pro Monat (* unter Nebenkosten versteht man Kosten für Heizung, Warmwasser oder ähnliche Betriebskosten)

☐ Nebenkosten unbekannt

Die angegebene Miete beinhaltet Parkplatzkosten ☐ ja ☐ nein

Die angegebene Miete beinhaltet Nebenkosten ☐ ja ☐ nein

2.20.2: Wer ist Wohnungs- bzw. Hauseigentümer?

☐ Verwandte

☐ Unternehmen, Versicherung, Pensions- kasse, Anlagestiftung und dergleichen

☐ sonstige Einzelperson

☐ Gemeinde (inkl. Schul-, Kirch-, Bürgerge- meinde), Gemeindeverband, Kanton, Bund

☐ Genossenschaft (inkl. Wohnbaugenossenschaft)

☐ Sonstige [_____]

XXXI

Fragen zu Ihrer Wohnsituation

FÜR EIGENTÜMER (sonst weiter mit 2.22)

2.21.1: In welchem Stadium haben Sie Ihre Immobilie gekauft?

☐ Immobilie in eigenem Auftrag gebaut
☐ Kauf eines Entwicklerprojekts (Kauf eines fremdgeplanten Neubaus)
☐ Kauf einer bestehenden Immobilie

2.21.2: Welchen Eigenmietwert müssen Sie gemäss Steuererklärung versteuern?

Fr. _____

2.21.3: Wie hoch war der Kaufpreis (inklusive Grundstück)?

Fr. _____

2.21.4: Wie viel haben Sie seit dem Kauf investiert?

Fr. _____

2.22: Wann sind Sie in Ihre Wohnung/Ihr Haus eingezogen?

Monat _____   Jahr _____

2.23: Wie zufrieden sind Sie mit...

	sehr unzufrieden									sehr zufrieden
	1	2	3	4	5	6	7	8	9	10
der Lage Ihrer Wohnung?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ihrer Wohnung als solcher?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ihrem Haushalt?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2.24: Möchten Sie uns im Bezug zu Ihrer Wohnsituation noch etwas Spezielles mitteilen?

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_____
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XXXII

Teil 3: Fragen zu Ihrem Lebensstil

3.1: Bitte kreuzen Sie an, in welcher Weise folgende Aussagen auf Sie zutreffen.

	trifft nicht zu	trifft eher nicht zu	weder noch	trifft eher zu	trifft zu
Beruflicher Erfolg und Aufstieg sind mir wichtig.	☐	☐	☐	☐	☐
Ich kaufe bewusst und umweltschonend ein.	☐	☐	☐	☐	☐
Ich probiere gerne Neues aus und suche Abwechslung.	☐	☐	☐	☐	☐
Ich achte aktiv auf eine ausgewogene Ernährung und eine gesunde Lebensweise.	☐	☐	☐	☐	☐
Ich mache worauf ich Lust habe, unabhängig davon was andere sagen.	☐	☐	☐	☐	☐
Ich strebe nach familiärer Sicherheit und Geborgenheit.	☐	☐	☐	☐	☐
Ich treibe regelmässig Sport.	☐	☐	☐	☐	☐
Ich verbringe meine Freizeit am liebsten im Rahmen meiner Familie.	☐	☐	☐	☐	☐
Ich mag es nicht, wenn sich mein Umfeld ständig verändert.	☐	☐	☐	☐	☐

3.2: Bitte kreuzen Sie an, wie oft Sie folgenden Aktivitäten nachgehen.

	nie	selten	manchmal	regelmässig	oft
Besuch von Theateraufführungen und Kunstausstellungen	☐	☐	☐	☐	☐
Gartenarbeiten	☐	☐	☐	☐	☐
Mitwirkung in einem oder mehreren Vereinen	☐	☐	☐	☐	☐
Besuch von Konzerten oder Sportveranstaltungen	☐	☐	☐	☐	☐
Spaziergänge und Velofahrten im Grünen	☐	☐	☐	☐	☐
Lektüre einer überregionalen Tageszeitung (z.B. NZZ, FAZ o.ä.)	☐	☐	☐	☐	☐
Handwerkliche Tätigkeiten (Hausarbeiten, Basteln, Modellbau etc.)	☐	☐	☐	☐	☐
ausgehen in Restaurants, Bars, Clubs und Diskotheken	☐	☐	☐	☐	☐
Bergtouren, Ski- oder Snowboardtouren	☐	☐	☐	☐	☐
Wellness	☐	☐	☐	☐	☐
Fernsehen: Unterhaltungssendungen und Shows	☐	☐	☐	☐	☐
Shopping	☐	☐	☐	☐	☐
Leistungssport/Fitness einzeln oder im Team	☐	☐	☐	☐	☐
Fernsehen: Dokumentationen, politische und kulturelle Magazine	☐	☐	☐	☐	☐
Kinobesuche	☐	☐	☐	☐	☐

XXXIII

Fragen zu Ihrem Lebensstil

Möchten Sie uns zum Schluss noch etwas mitteilen? Haben Sie Anmerkungen und Kommentare zu dieser Befragung?

Vielen Dank für Ihre Hilfe!