

# Adjustment of the owner-occupied housing sector in an area with demographic decline

Understanding household preferences of households in East-Groningen using a stated choice experiment



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## PREFACE

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This graduation thesis concludes my master studies at Eindhoven University of Technology. Before attending the master track in Eindhoven I obtained my bachelors degree of Built Environment at Windesheim University of Applied Sciences in Zwolle.

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During the research I faced many challenges, from finding a suitable subject, the literature research, finding the respondents, to handling the data. Having overcome all these I am proud of this thesis.

Cecile van Amerongen

Zwolle, October 2015



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## MANAGEMENT SUMMARY

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The dynamics of the housing market is a great influencer of realizing housing preferences. When the dynamics flow works well in the housing market, more households are likely to find a property of their choice. However in shrinking areas, where the population and the number of households decline problems occur in the housing market. The changing demographics will lead to a changing housing demand, leading to a changing housing market.

Demographic trends influence the housing market, an increasing number of regions is dealing with shrinkage. However shrinkage of the population is from all times and occurs all over the world. The focus will be on one of the shrinking areas in the Netherlands: East-Groningen, an area in the North East of the Netherlands with a relatively large number of owner-occupied properties therefore the focus will be on this area. The other shrinking areas in Groningen are left out of this research due to uncertain circumstances of earthquakes issues due to gas extraction. East-Groningen is an area in the Netherlands with 150 thousand of 16.7 million Dutch people. The area is considered a rural area with only three towns with more than 18,000 inhabitants. In total 67,000 households are present in this area in 2012. The prognosis states that in 2040 the population will decline with 17.6% to 122,700 people and the households decline with 11.6% to 59,000 in 2040. The housing stock in East-Groningen is expected to decline from 68,200 houses in 2014 to 65,400 properties in 2040, a decline of 4%. This is not in line with the expected decline in the number of households and this will lead to major vacancy.

This research is conducted to understand the housing and housing location preferences of owner-occupiers in East-Groningen, this to understand which houses and location are preferred and which are not. Not preferred properties need to be withdrawn from the housing market to prevent major vacancy in the future.

### Methodology

A questionnaire was used with a stated choice experiment. This stated choice (SC) experiment elicits the most important housing and housing location characteristics in housing choice decision of owner-occupiers in East-Groningen. In total 10 characteristics are included in two sets of 5. The first set is about the house and includes, the price, housing type, size, building year and whether it is on a single floor. The second set is about the housing location and includes: level of urbanism, distance to shops, medical facilities, primary school and friends / family.

Data of 88 respondents was used to estimate two Logit models: the Multinomial Logit (MNL) and the Latent Class (LC) model. The MNL model is the standard model for analyzing discrete choices, and can be derived from utility maximization. The preferences of all respondents are represented by one set of utility weight parameters. This model does not accommodate for heterogeneity of consumer choice behavior. The LC model does take heterogeneity into account. This model assumes homogeneous preference classes exist, which can be identified based on the observed choices. In total two different classes are distinguished in the LC model.

### Results and Conclusion

The MNL model of the housing had a sufficient goodness of fit (0.17) according to the  $\rho^2$  of McFadden, the location model is considered weak with a goodness of fit of 0.03. In the MNL model the expected housing preferences (cheaper, detached, new and with more space) are estimated. The location was preferred to be in a rural area and the distance to medical facilities was relatively important for the respondents.

The  $\rho^2$  of McFadden showed a better goodness of fit for both the housing and the location. The housing has a good fit with 0.25 and the location a sufficient fit with 0.14. This indicates that the Latent Class model is a better fit than the MNL model.

In the Latent Class model two different classes are distinguished for the housing and the location estimates. For the housing preferences these classes are moderates and freedom seekers, for the location preferences moderates and shoppers are distinguished. The freedom seekers have the strongest preference for the part-worth utility of the detached property. Both groups of moderates show less extreme values for the attributes in the models.

The Pearson's Chi-square tests show 3 significant relationships between the housing choice and current ownership, housing choice and current housing type and location choice and gender of the respondent. Indicating that moderates include most of the people currently living in a rented property and the freedom seekers include a high percentage of people currently living in a detached property. The relationship in the location model is with gender, indicating that most female respondents are classified as moderates instead of shoppers.

The estimations of LC model are compared to the current housing stock. The results of this comparison indicate that the current housing stock needs to be adjusted to meet the needs of the owner-occupied sector in East-Groningen, expensive terraced / corner houses with a small size and with a building year before 1945 are not preferred any more. The combination of these part-worth negative utilities can be seen by both classes in the LC model. The moderates show a stronger aversion to the high price, small size and the building year, and the freedom seekers indicate the terraced / corner housing type as the most negative part-worth utility.

The results for the preferred locations do correspond to the possibilities that are offered by the current owner-occupied housing market in East-Groningen. Therefore do the location preferences meet the needs of the customer in East-Groningen.

When possible the properties that are not preferred need to be removed from the housing market. This removal could be done by demolition, adjustment to preferred or by changing the primary function of the property. By doing so there will be less properties vacant and this will influence the market in a positive manner. The location of the properties where intervention is needed is not important because the current housing locations do meet the needs of the owner-occupier in East-Groningen.

### **Advise**

It is advised that municipalities get help to house owners to become aware of the housing issues and to be encouraged to take action to withdraw not-preferred properties from the local housing market. This research could be used to determine where the help is needed in the market.

The research is limited to the literature study that was conducted and the small sample of the population. Only 88 respondents were included in the research and the sample had a reduced validity because of differences between the sample and the population and the sample and the current housing situation of the households in East-Groningen. Further research could refer to the entire housing market instead of the owner-occupied sector and the number of attributes used in this research was limited to 10, while more attributes might influence the housing decisions. Besides this the current research does not include the number of owner-occupied properties that need to be withdrawn from the market at a certain moment in time to balance the housing market in East-Groningen.

# 1 INTRODUCTION

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The dynamics of the housing market is a great influencer of realizing housing preferences. When the dynamics flow works well in the housing market, more households are likely to find a property of their choice. Households who are in search of a new house depend on the supply of houses. The number of houses available is influenced by the building production and the availability of properties after residents move out. The recent economic crisis put more pressure on the housing market (CBS, 2012a). There are less houses being sold and housing corporations have smaller budgets. These factors are leading to a reduced dynamic of the housing market since 2007. Fewer households can afford to move, and more people than ever want to move (BZK, 2013).

## 1.1 PROBLEM DEFINITION

The problems mentioned are causing problems in the housing market. In shrinking areas where the population and the number of households decline, the impact of problems in the housing market increases. The general problems of the housing market (e.g. the stagnation of the housing market due to the economic crisis) also occur in these areas, besides this the shrinking number of household leads to a shrinking housing demand. These problems together have a major impact on the housing market in shrinking areas.

Shrinking areas occur all over the world. In the Netherlands three areas are currently dealing with demographic shrinkage, Zeeuws-Vlaanderen in the South West, Southern Limburg in the South East and North East-Groningen in the North East of the Netherlands. These three areas have different problems and different situations and therefore they cannot be compared. The focus of this research will be on East-Groningen. As everywhere the housing market in East-Groningen is divided into two major sectors the owner-occupied and the rented sector. In East-Groningen the percentage of owner-occupied properties is relatively high (65%) compared to the National average (59%) (BZK / CBS, 2012). Therefore the focus will be on the owner-occupied sector in East-Groningen.

The supply does not meet the demand in the local housing market in East-Groningen. Due to the declining population and changing households a high vacancy rate will occur in shrinking areas, therefore the housing market needs to be adjusted to the changing demand. Research needs to be done on how the housing stock needs to be adjusted, demolished or replaced to be prepared for the future housing demand.

## 1.2 RESEARCH QUESTION

The research will exist of a main research question supported with a couple of sub questions to answer the main question. The main focus of this research is on the owner-occupied sector in East-Groningen. The demographic trends such as shrinking population, shrinking number of households, and the changing household composition will be researched. The changing demographics will lead to a changing housing demand, which leads to a changing housing market. This market needs to be adjusted in several parts. The main research question is:

*How to adjust the owner-occupied housing sector towards today's demographic trends in the shrinking area of East-Groningen according to the housing and housing location preferences of people in this area and in which parts of the owner-occupied sector is intervention needed?*

### 1.2.1 Sub questions

In order to give an answer to the main research question, three sub questions have been formulated. The sub questions are about the demographic factors influencing the households, the attributes or factors that are most important for the housing choices of owner-occupied households in East-Groningen and whether the current owner-occupied sector still meets the needs of the customer. The sub questions are:

1. What are the current and future demographic factors that influence households?
2. What are the most influencing attributes for the housing choices of owner-occupied households in the shrinking area?
3. Does the owner-occupied sector still meet the needs of the customer in the area of Groningen?

## 1.3 RESEARCH DESIGN

The research will start with a literature study, the demographics and the housing market will be analyzed. The 10 most important attributes will be selected for a stated choice experiment and the experiment will be included in an online survey. Data that is gathered through the survey will be analyzed using Multinomial Logit and Latent Class models. An overview of the research design is showed in figure 1.

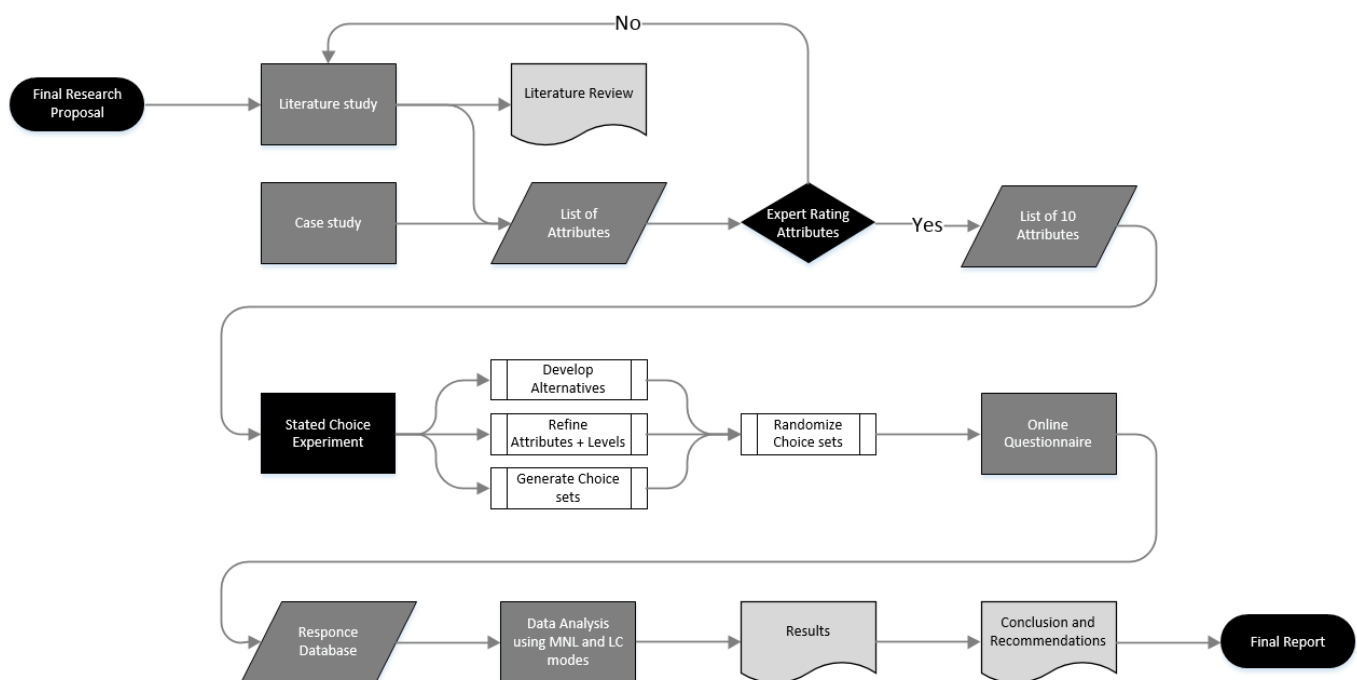


Figure 1: Research Design

## 1.4 EXPECTED RESULTS

The results of this research should give an indication of the most important factors and the preferences of the people in East-Groningen that need to be taken into account when investing in the affected owner-occupied sector in the area of East-Groningen. The combination of demographic factors and current research in how to deal with this part of the housing market can point to a direction in which houses can be removed from the market. For this reason choice behavior is measured to predict housing preferences and choices in this area.

## 1.5 RESEARCH LIMITATIONS

The research is executed within a strict time frame and therefore it is not possible to discuss all elements that are important in the housing decision process and the housing policies of the government. The focus of this research is the owner-occupied housing sector in the shrinking area of East-Groningen. The research is based on collected data, the results of the stated choice experiment are compared to the current housing market where the latest available data is used when possible. Another limitation is the size of the research, which is limited to the number of respondents that complete the questionnaire.

## 1.6 READING GUIDE

This research paper is divided into 6 chapters. The first and current chapter is the introduction to the problem which is followed by the second chapter about demographic trends that occur around the world. These trends will be narrowed down from global to European to National scale. The trends will lead to demographic growth or demographic decline and influence the housing market.

Chapter 3 reviews the housing problem in a shrinking area. The demographic change creates problems in the housing market in the Netherlands and in East-Groningen, which is one of the three shrinking areas in the Netherlands. The current housing market is set out including prognosis and preferences of people who are willing to move.

The fourth chapter is about the methodology of measuring the housing choice behavior, in this chapter the stated choice experiment is explained step by step. The data that is obtained through the stated choice experiment is analyzed in chapter 5. And in the final chapter the conclusion and discussion are presented.



## 2 DEMOGRAPHIC TRENDS INFLUENCING THE HOUSING MARKET

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This chapter is about the demographic trends and how these influence the housing market. Since the turn of the 21<sup>st</sup> century, there is an increasing number of publications about shrinking cities. However the opposite of shrinkage, growth, is dominating the literature in the urbanism field since the industrialization (Hannemann, Kabisch, & Weiske as cited in Pusch, 2013; Oswalt, 2005; Prigge, 2005). In this chapter the worldwide demographic trends are discussed in the first paragraph. In the second paragraph demographic shrinkage is divided into decrease of the general population, labor force and the number of households and finally in the third paragraph housing market is discussed.

### 2.1 DEMOGRAPHIC TRENDS

Demographic trends reveal developments and changes in the human population. Demography examines the relationship of changes through deaths, births and migration in demographic composition. The population can decline, stabilize or grow during the years. In the following subparagraphs the Worldwide, European and Dutch demographic trends are explained.

#### 2.1.1 Worldwide

Demographic shrinkage has been researched frequently. However many studies of demographic shrinkage focus on urban shrinkage, with shrinking cities of more than 100,000 inhabitants. The accumulation of shrinking city research in the 21st century line out that there is an end of the growth era (e.g. Hannemann et al. as cited in Pusch., 2013; Oswalt, 2005). An increasing number of shrinking cities appear in an African or Asian context during the past decade. However, research focuses strongly on countries in the 'western world' such as Germany, England and the USA (Oswalt & Reiniets, 2006; Oswalt, 2005).

Shrinkage is a phenomenon that has occurred in all times all over the world. It was initially approached as being part of the life cycle in which periods of both urbanization and counter-urbanization were experienced (Berry, Rust and Drewitt et al. as cited in Panagopoulos, Guimarães, & Barreira, 2015). Urban revitalization was promoted in response to decline which improved the attractiveness of cities for inhabitants, businesses, visitors and investors, thus reversing the process of decline. When historically viewed urbanization (the process by which population is geographically concentrated) is hardly a linear process, it unfolds in phases (Beauregard, 2009).

At this moment 7.3 billion people live on the planet, half of which live in cities. Every year another 60 million people joins the people in the cities. This growth influences the demographics of the surrounding regions and besides this it does not apply to every city, there has been a change from population growth towards a phase of prolonged population reduction, which is a process that has not happened before. This population reduction is happening all over the world, for example Japan's rural areas have been shrinking for decades (Edgington, 2012), in the USA smaller towns are also dealing with shrinkage for a longer period already (Bowns, 2013).

However shrinking areas have been considered unusual or regionally limited exceptions until now. In the past there are numerous examples of shrinking areas, but the causes were for example wars, catastrophes and epidemics. Some places experienced prolonged phases of decline for instance ancient Rome, or cities disappeared such as ancient Atlantis. Shrinkage is different from these historical examples, the decline occurs over longer periods of time and in time of peace (Kulturstiftung des Bundes, 2005).

The percentage of urban population grew from 3% in 1800, 14% in 1900 to 47% in 2000. The number and sizes of cities grew equally fast, however shrinkage occurred in cities and regions as well, starting in the rural areas followed by cities that grew during the industrial revolution (London, Manchester, Liverpool, Lille, Berlin). In the USA shrinkage occurred after the second world war and included Chicago, Detroit, Philadelphia and Washington. In after the second world war rural shrinkage occurred in other countries as well, for example Japan and Italy, since 1970 shrinkage occurred also in cities in these countries (Matanle, 2010; Pusch, 2013).

### 2.1.2 Europe

The debate in Europe around population decline originated in the Anglo-Saxon school, which developed after the Second World War mainly as a consequence of the economic transformations arising from deindustrialization. The concept of shrinkage was introduced during the 1980s by the German school (Hoekveld, 2014). With respect to US cities that have lost population, (Beauregard, 2009) the word 'shrinkage' only applied to the period between 1980 and 2000, distinguishing them from 'aberrant' and 'declining' cities that faced reductions in inhabitants during 1820 to 1920 and 1950 to 1980, respectively.

In Europe shrinkage is varying strong between regions. Aging is occurring and a reduced population growth is influencing the demographics in Europe. In Eastern Europe regions are dealing with a challenge of labor force. The labor force is declining due to migration and a negative natural growth. In parts of Eastern Europe, remote areas in Scandinavia and Southern Europe and Eastern Germany regions are also dealing with a challenge of decline. The population is shrinking due to a low fertility rate and a high number of migrators. The number of elderly people is high and the percentage of young people is relatively low (de Jong, ter Veer, & Beets, 2013).

### 2.1.3 Netherlands

In the Netherlands a fast population growth occurred after the second world war in the 50s and 60s, after which the population growth went smoothly. Between 1975 and 2005 the population grew from 13,6 to 16,3 million (20%) and the number of households increased from 4.6 to 7.1 million (55%). On January 1, 2015 the Netherlands counted 16.9 million inhabitants (CBS, 2015a). The Demographic growth is expected to last another 30 years, but the growth will be reduced compared to the past, the growth will centralize in several areas in the Netherlands, in other areas the growth will turn into a shrinkage of the population (Jong & Duin, 2012).

The number of households used to grow almost equally to the number of people. This is the result of a major household dilution. The average household decreased from 2.9 people per household in 1980 to 2.2 people in 2010 and in 1971 the average was 3.25 people per household (Ritsema van Eck, van Dam, de

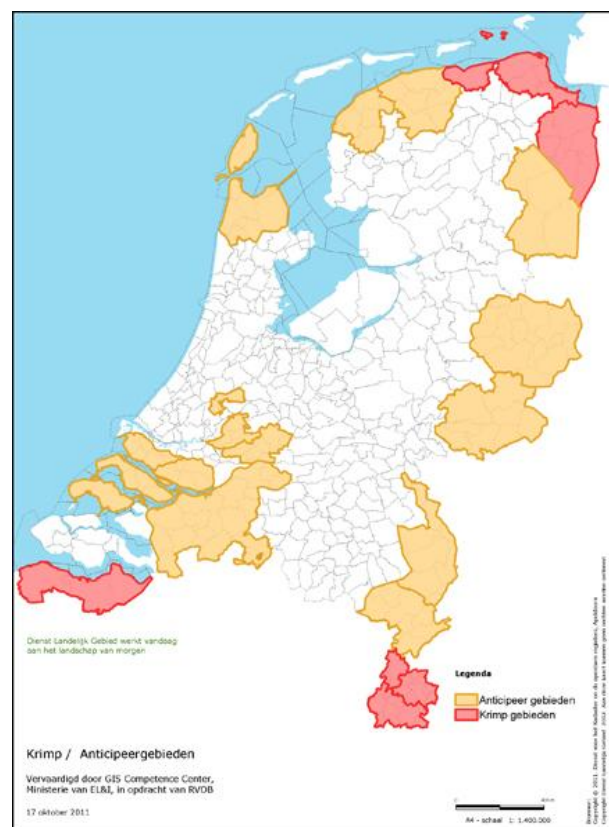


Figure 2: Shrinking and anticipating area's in the Netherlands (Dienst Landelijk Gebied, 2011)



Groot, & de Jong, 2013). The single and 2-persons households increased rapidly (Dam, Groot, & Verwest, 2006). In certain areas in the Netherlands shrinking is already occurring since 1997 (Verwest, Sorel, & Buitelaar, 2008).

There are 23 regions in the Netherlands where demographic decline is expected according to the current demographic expectations. These regions are shown in figure 2, the areas that expect demographic decline are marked orange. There are three “topkrimpgebieden” in the Netherlands that are dealing with a sharp population demographic decline already. These areas are known as Zeeuws Vlaanderen, Southern Limburg (Maastricht Mergelland, Westelijke Mijnstreek and Parkstad) and North East-Groningen (Eemdelta, De Marne and East-Groningen).

## 2.2 DEMOGRAPHIC SHRINKAGE

Shrinkage can refer to several aspects. It can refer to either economical or demographical developments. According to the Dutch “van Dale” dictionary shrinkage is contraction or reduction (van Dale, 2015). The organization for population decline describes shrinkage as a structural decline in the population. Other words for shrinkage are: urban revitalization (Beauregard, 2009) aberrant and declining cities, decay, abandonment, suburbanization, urban crisis and demographic change (Haase, Rink, Grossmann, Bernt, & Mykhnenko, 2014).

The transformation is affecting the population in two different ways: The population is declining (shrinking) and the composition of the population is changing (Ministerie van BZK; VNG; IPO, 2009). There are three different types of demographic decline distinguished by the Dutch Environmental Assessment Agency (Planbureau voor de leefomgeving) (PBL, 2015).

- Decreasing of the general population,
- Decreasing of the labor force (20-65 year),
- and decreasing of the number of households.

### **Decrease of general population**

The population declines when the natural balance (number of births minus number of deaths) and the migration balance (number of immigrants minus number of emigrants) both are negative, or when the negative natural balance is larger than the positive migration balance, or when the negative migration balance is larger than the positive natural balance

Population decline and aging are closely related. An aging population can cause a decline in the population because of lower birth rates and higher death rates.

### **Decrease of the labor force**

The working age population (beroepsbevolking) contains all persons between 20-65 years, and are considered to be able to participate in the production process (CBS, 2015b). There is a difference between the working age population, the labor force and the economically active population. The working age population contains all persons between 20-65 years old. The labor force are all people between 20-65 years old that are professionally employed, accepted employment or are willing to work, and the economically active population are the people who have accepted employment for at least 12 hours a week.

### **Decrease of number of households**

Household decline occurs when the number of households in a particular area decreases over a certain number of years. The number of households falls when new households are formed slower than there are households dissolved. The household decline is lower than the population decline, this is caused by a decrease in household size. Therefore changes in household composition, which results in more 1 and 2 persons households, is affecting the housing market (Verwest, 2011)

#### **2.2.1 Shrinking area**

The Dutch Central Statistics agency (2013) (CBS) defines a shrinking area as follows: a region with a population decline of at least 1% compared to 7 years ago. This is determined on the basis of the shrinking criterion which is set by the National Dutch Government and determines when a region is a shrinking region (CBS, 2013). Shrinkage does not only occur in the Netherlands.

According to Grossmann (cited in Pusch, 2013), the discourse of the shrinking city debate can be subdivided into different periods, the period of tabooing shrinkage: very few academic and almost no political discussion on shrinking cities in the period of the industrialization until 2000. In Germany the sociologists Häußermann & Siebel tried to bring the discourse of urban shrinkage to the academic debate, however the publication was not resumed until the 21<sup>st</sup> century. Häußermann & Siebel (cited in Pusch, 2013) argue that the actual problem of shrinkage development is the politics focus on growth in urban planning.

Southern Limburg is focusing on their own unique position, they are focusing internationally onto Germany and Belgium. Limburg is the first area that embraced shrinkage and decided to work with it instead of against it (BZK, VNG, IPO, 2012).

North-East Groningen is a special area that deals with shrinkage, there are also earthquakes occurring due to gas extraction. Therefore the housing sector is affected by two different causes, damage by earthquakes and the demographic decline. The Groningen area is known for the larger percentage of owner-occupied properties and is therefore especially focused on the owner-occupied sector (BZK, VNG, IPO, 2012). The region has a larger owner-occupied sector (65%) than the average in the Netherlands (59%) (CBS, 2012b).

The focus of this research will be on East-Groningen, a region with 7 municipalities. The other shrinking areas in Groningen will be left out of the research due to the uncertain circumstances of the earthquake issues. The earthquakes have no impact in the East-Groningen region.

### **2.3 HOUSING MARKET**

The Dutch system for spatial development is originated in the Housing act of 1901. The act was introduced to improve the health of the population living in dilapidating cities. The specific demands of the housing act led to standardization of the production of houses. For almost a century this approach led to the answer to the persistent demand for space. From the reconstruction after the second world war, the growth policy in the 70s and the VINEX policy, all these building projects were quantity-oriented due to the housing act. However the demand for space is changing from quantity towards quality, therefore the housing system is not working flawlessly anymore. The spaces with excellent conditions that fit well within the needs of the customer are used, all other spaces will remain vacant. Therefore the housing system needs to shift from supply driven towards demand driven (Bergeroet & Tuijl, 2013).

Shrinkage of the population leads to two different problems in the housing market. First of all the demand for smaller houses will decline due to a decrease in the number of households, and there also will be a change in housing demand because the household composition is changing.

When municipalities are confronted with a household decline, it will affect their housing market. Thus transformation of the market needs to occur. Due to the household decline and the consequences this brings the focus needs to shift from extending the housing market towards reducing and transforming the current housing stock. In shrinking areas the housing market changes from a suppliers market into a buyer's market. In a suppliers market there is a lot of demand and there is only a small number of supply, therefore the suppliers are in favor. In a demanding market the request for houses does not catch up with the demand therefore the buyers are in favor here. In a shrinking area the housing market is a buyer's market.

### **2.3.1 Market fluctuation**

It is important to notice that with a shrinking demand, the supply does not decline on its own. An excessive supply of space leads to vacancy. Regular vacancy, frictional vacancy is not a problem on its own. When an occupier moves it is normal for a property to be empty for a while. Major structural vacancy due to shrinkage is a problem. Abandoned properties cost more to maintain and in mortgage payments than they take in. To ensure the quality of life within a shrinking area it is important to minimize the structural vacancy (Bergevoet & Tuijl, 2013).

Demographic shrinkage offers, besides threats, also opportunities. In region with a huge housing shortage leads shrinkage to a reduced pressure on the housing market. Moreover any vacancy in certain neighborhoods is a good indication of the appreciation of the housing types and the residential environments (Dam et al., 2006).

Shrinkage can create a demand shortage. The shifting from a supply market into a demanding market has positive and negative factors. People that are searching for a place will profit from this market situation, they can realize their housing preferences for a reduced price. The disadvantage of this market situation will be felt by the suppliers of housing. There could be an oversupply in housing in the rent and owner-occupied sector. The renting sector is sensitive to vacancy and profit from rent will decrease. In the owner-occupied sector the market situation will lead to slower transaction speed and decreased sales prices (Verwest, Sorel, & Buitelaar, 2009).

The shrinkage of the number of households may lead to concentration of lower-income groups. The people who can afford to move to a better valued residential area will do so and the people who cannot afford to move will stay behind in the less attractive environments (Verwest et al., 2008, 2009). This may lead to vacancy and pauperization of the properties.

### **2.3.2 Households**

Households are being able to make the connections between the socio-economic changes and the transformations of the built environment. Households have diverse housing, transport and consumption needs. Housing choices are contingent on the number of households features, such as number of wage earners, employment patterns and income levels. Household needs may vary with changes of the household composition or the socio-economic factors (Buzar, Ogden, & Hall, 2005).

### **2.3.3 Changing housing demand**

When the number of households is declining, the housing demand will reduce. This will occur in the rented and the owner-occupied sector. Besides this, many shrinking areas are dealing with aging and rejuvenation of the population, this leads to a changing housing demand. The reduced and changing

demand ask for a transformation of the housing stock. This transformation needs to occur in both sectors, in the rented sector there is a major task for the housing corporations, in the owner-occupied sector this task is more difficult because all owner-occupiers are also stakeholders in this transformation process. Due to the large number of owner-occupiers policy is needed. This policy could be initiated by the government (e.g. municipality or province). Regardless of the sector there are according to Verwest et al. (2008) four different strategies for the transformation:

1. *Demolition of the least attractive properties.* Removing properties through demolition is for some people controversial due to destruction of capital, or due to emotional value of people. Demolishing individual properties or parts of a housing block can create a new housing type. For example by demolishing some row houses, additional corner houses can be created, the additional space can be used as a garden extension or carport, therefore the housing quality can improve.
2. *Restructuring present housing stock.* By restructuring the houses can be adjusted to the housing preferences. Therefore it can be prevented that households move away in search of their house of preference. Shrinkage leads to an elderly populations, and elderly people have different housing preferences, therefore houses need to be adjusted to the life course of this target group.
3. *Reducing new building plans.* Reducing building plans could be necessary, however some new build is needed to create a qualitative improvement. The province of Groningen is implementing a building quota policy to decide where and how many new houses can be build. When municipalities deviate from this quota the province has the possibility to stop the plan by withholding approval of the zoning plans. In article 4.7 sub 1 of the Environmental regulation plan of the province of Groningen (2015) is stated that the province needs to approve residential building plans in the province.
4. *Changing the primary function of the property.* This strategy could be applied by approving houses to be a second home. This results in higher housing prices which could result in higher prices in the area.

## 2.4 CONCLUSION

The demographic trends influence the housing market, there is an increasing number of regions dealing with shrinkage. Shrinkage of the population is however of all times, and it occurs all over the world. In the Netherlands 3 areas are dealing with shrinkage already, North-East Groningen is one of these areas. The focus of this research will be on East-Groningen. The other shrinking areas in Groningen will be left out of the research due to the uncertain circumstances of the earthquake issues.

Demographic decline is divided into three different types, decrease of the general population, decrease of the labor force and the decrease of the number of households. The decline will influence the housing market. Leading to a smaller and changed demand for houses. The changing housing demand asks for actions in the current housing stock.

In the following chapter the housing problem in a shrinking area will be reviewed. The focus will be on the owner-occupied housing market in the Netherlands in general and the market in East-Groningen. The demographic prognoses are divided into the population, divided by age and the number of households. The prognoses for the housing stock show major problems for the housing market in the future and the current situation in the housing market is discussed, followed by the housing preferences and the willingness to move measured by the WOON research (BZK / CBS, 2012).

### 3 HOUSING PROBLEM IN A SHRINKING AREA

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The demographic trends influence the complex housing market. The market is complex with, at micro scale level, individual housing choices of households and at the macro level, the housing policies are set by the Government. As stated in the previous chapter the focus of this research is on East-Groningen. East-Groningen is one of the 40 COROP<sup>1</sup> areas in the Netherlands. A COROP area is a regional area between province and municipality level, which consists of several adjacent municipalities (CBS, 2015c). This division is used for analytical purposes by the Dutch Statistical Agency (CBS). The COROP area of East-Groningen is the eastern part of the Northern province of Groningen in the Netherlands. The housing market, demographic prognoses and the current housing stock of East-Groningen and the Netherlands are described in this chapter.

#### 3.1 THE HOUSING MARKET

At the moment a small number of municipalities in the Netherlands are dealing with a declining population. The decline of the population is happening due to selective migration: young singles and couples are leaving the area due to work or study and do not return to the region. Besides this there is a trend occurring in the size of the households. There is a decline in the size of households due to more single households and more divorces. This decline in household size does not lead up to a higher housing demand, combined this leads to a smaller demand for housing, with vacancy as a result. Besides this, aging is an occurring problem, a higher percentage of the population will become elderly (Koopman, 2010).

The low welfare growth, economic decline and the decline of the number of households are leading to a decline in housing prices.

##### 3.1.1 Vacancy

Vacancy is necessary for a working housing market, however excessive growth of vacant properties has a negative impact. Households will move to a better property when possible and try to move to a nicer area. The vacancy will occur in the lower segment of the market. The decline of the number of young people in the housing market (starters) has an immediate reflection in the rental sector. Besides the rental sector the owner-occupied sector will be a victim when the occupier moves on and abandons a building.

The neighborhoods which were build right after the second world war most likely have to deal with vacancy (Dam et al., 2006). Structural vacancy leads to two problems:

- Degradation of buildings and a reduction of the quality of life. The pleasure of living will be reduced and owner-occupiers are dealing with a declining sales price.
- Too much vacancy will lead to a decline of the overall sales price in the region, when. Vacancy offers the opportunity for the owner-occupier to move because the prices of the properties need to drop because of more competition on the market. (Koopman, 2010).

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<sup>1</sup> COROP stands for: Coördinatie COMissie Regionaal OnderzoeksProgramma and was initiated in 1971.

### 3.1.2 Macro versus micro scale

The housing market is influenced at different levels. A conceptual model is shown in figure 3. The largest level is the macro scale, this is the National scale in which housing policies are set by politics, and demographic, social-economic and social-cultural developments occur. Next there is the regional level, this level is in between the macro and the micro scale. At this level the housing policies of nearby municipalities are matched, by regional partnerships or the province. At the regional level the housing market is demography-driven in the sense that supplies of housing react to the development of the number of households in the region. This leads to the accessibility and availability of properties in the housing market. Lastly there is the smallest level, the micro scale, that is the scale where the individual housing choices are made according to different life phases, personal preferences and triggers (Mulder & Hooimeijer, 1999; Bos & de Bruin, 2007).

All different levels are connected. Together all the individual movements on the micro scale have a collective influence on the macro scale. The accessibility and availability of houses influence the moving behavior of individuals and the individual moving behavior influences the overall movement in the housing market. It is important to know the preferences of individual because it is directly connected to the other scales of the housing market.

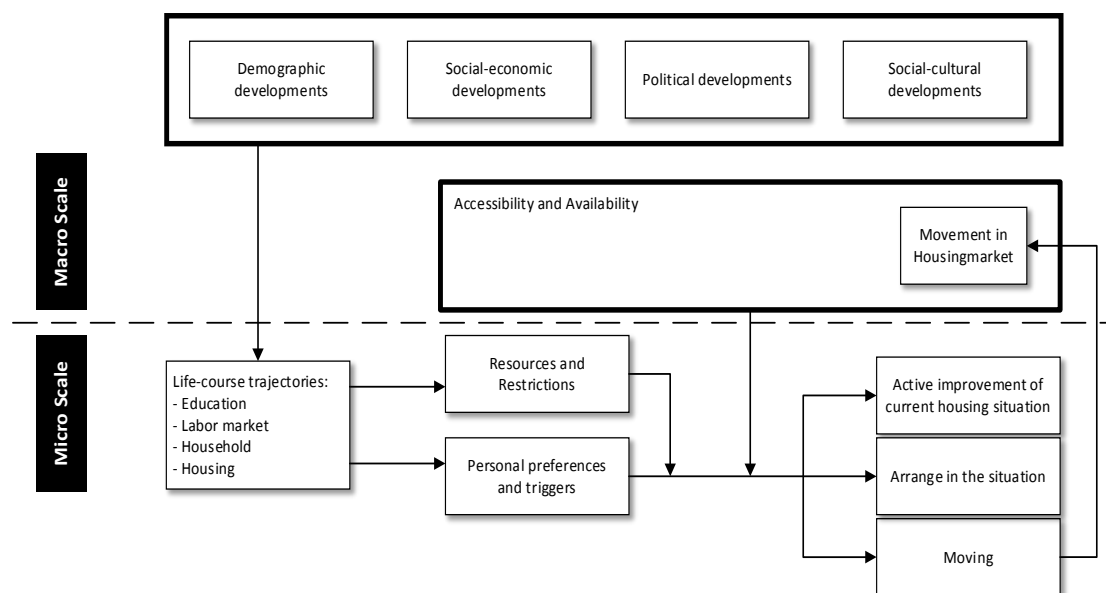


Figure 3: Conceptual model of housing market (Bos & de Bruin, 2007; Mulder & Hooimeijer, 1999) own editing.

### 3.2 EAST-GRONINGEN

Total population in 2012 in the Netherlands was 16.7 million people and in East-Groningen 150,000. This means that less than 1% of the Dutch population lives in East-Groningen. The area of East-Groningen consists of 90,000 of 4.2 million Hectare in the Netherlands, which is 2.2% of the Netherlands (CBS, 2012c).

East-Groningen is a COROP area in the North East of the Netherlands (see figure 4) and consists of 7 different municipalities (Bellingwedde, Menterwolde, Oldambt, Pekela, Stadskanaal, Veendam and Vlagtwedde) and is considered a rural area. 48% of the inhabitants live in an area with a maximum of 500 addresses per km<sup>2</sup>, 28% live in an area with maximum of 1000 addresses per km<sup>2</sup> and 18% in a moderate urban area (max 1500 addresses per km<sup>2</sup>) The other 6 % lives in an urban area with more than 1500 addresses per km<sup>2</sup>) (CBS, 2014a).



Figure 4: COROP area's in the Netherlands (CBS, 2015c) own editing.

There are 3 larger towns:

- Veendam (20,050 inhabitants),
- Stadskanaal (19,895 inhabitants) and
- Winschoten (18,205).

There are 5 villages with 5000 – 10,000 inhabitants (Ter Apel, Oude Pekela, Musselkanaal, Scheemda-Heiligerlee and Wildervank). And there are several smaller townships. In total there are 20 towns with at least 500 addresses in East-Groningen (CBS, 2012c).

A global overview of the population in percentages is shown in figure 5. In East-Groningen there are two main differences in age distribution if compared to the Netherlands. On one hand there are significantly less people between the ages of 15 and 40, on the other hand there are relatively more people aged 45 and older with a peak at 60 years old. This can be explained because East-Groningen is a shrinking area, young people leave the area due to work or study and do not return to the area. This leads to a higher percentage of middle aged and elderly people in the area of East-Groningen.

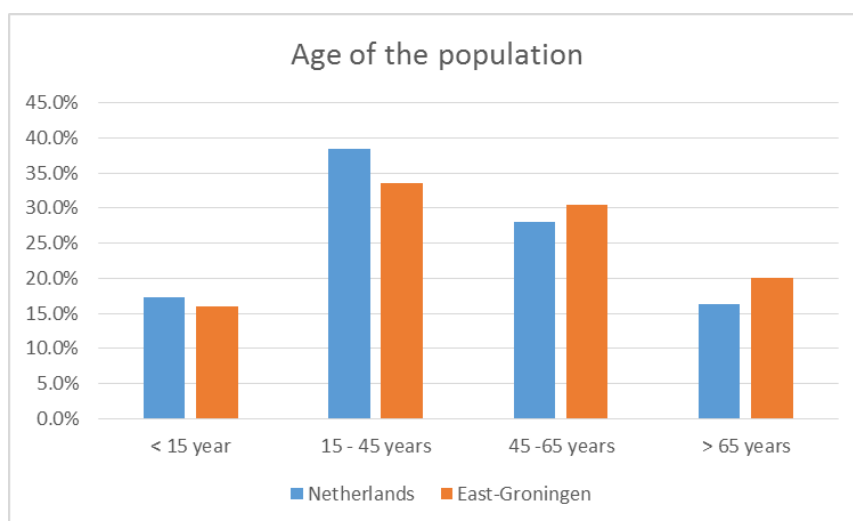


Figure 5: Age distribution Netherlands and East-Groningen (CBS, 2014b)

### 3.2.1 Households

In total there are 67,000 households in East-Groningen and 7.5 million in the Netherlands in 2012. This means that 0.9% of all households in the Netherlands live in East-Groningen. 21,300 households in East-Groningen are single person households this is 31.8% of the households, the other 68.4% are more person households. There are about 5% less single person households and 5% more 2-persons households in East-Groningen compared to the Netherlands, this is shown in figure 6. With an average of 2.2 persons per household is the situation in East-Groningen comparable with the Dutch average.

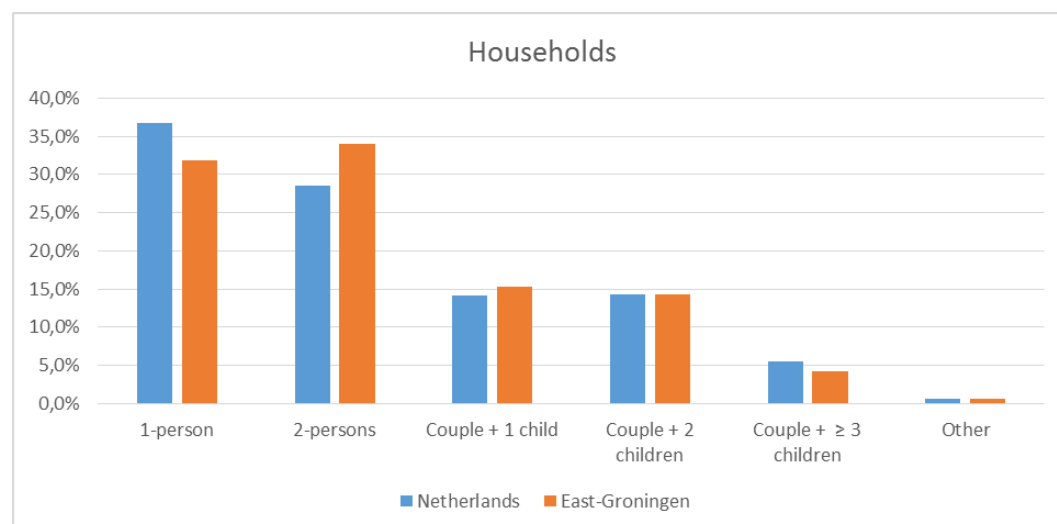


Figure 6: Household composition (CBS, 2012d)

The age of the head of the household<sup>2</sup> differs in East-Groningen compared to the Netherlands. In East-Groningen there are fewer households in the range of 15-45 years old compared to the Dutch average, in East-Groningen more households are aged 45 and up compared to the Netherlands. This is shown in Figure 6 and this follows the information about age in Appendix I. This is also due to the demographic shrinkage in the area. Young people leave the area for work and study and do not return to the region, leaving elderly households behind.

### 3.3 PROGNoses

There is a demographic decline in East-Groningen. The number of households and the population will decline over the next decades. According to the Primos prognosis from ABF research (2014), the Dutch population will increase by 5.8% to 17.8 million people in 2040 and the population in East-Groningen will Decline to 122,700 people in 2040. This is a decline of 17.6% compared to 2014. The population prognosis is shown in figure. 7.

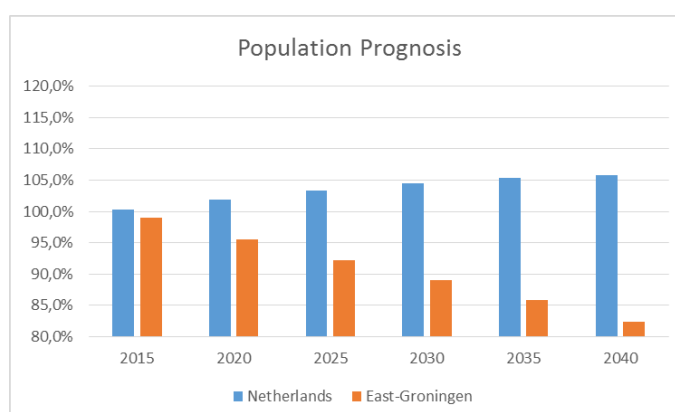


Figure 7: Population Prognosis (Research, 2014)

<sup>2</sup> Head of the household: Within a couple the (oldest) male, in a single parent family the parent, in any other household: the oldest male of age or when not present the oldest women of age.



### 3.3.1 Population

The population prognosis in the Netherlands (figure 8) shows an increase of the percentage of the population aged 15-45 and 65 and older. The 45-65 age group will decline from 28% to 23% with respect to the total population. And the age group < 15 years will remain around 16% of the population until 2040. In East-Groningen the population shows a different trend (figure 9). The group < 15 years old will remain stable around 14%, the 15-45 years old group remains around 30% of the population, the 45-65 group will decrease from 31% in 2014 to 23% in 2040 and the eldest group of 65 years and older will increase from 22% in 2014 to 34% of the population in 2040 (ABF Research, 2014).

This is the result of the young people moving away and not returning. In several years this leads to a declined labor force which starts with a smaller population of 15 to 45 year old and as time passes this group will affect the 45 to 65 year old population which declines as well. Besides this the percentage of children (< 15 year) in East-Groningen is comparable with the national percentage of children and this will remain stable because children do not make their own housing choices and live with their parents until a certain age. The percentage of elderly people in East-Groningen will grow a bit stronger than the national prognosis, due to the decrease of the younger population.

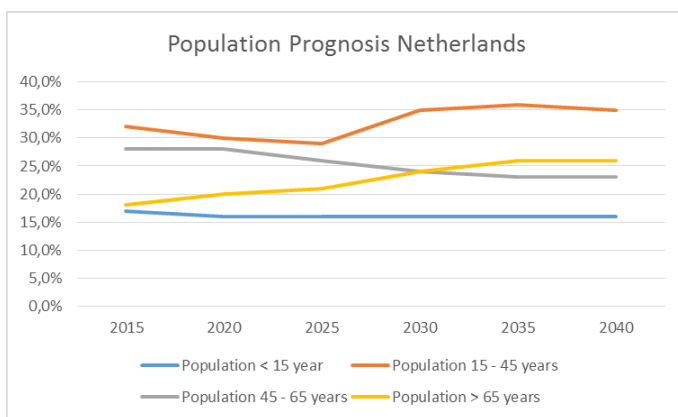


Figure 8: Population Prognosis Netherlands (ABF Research, 2014)

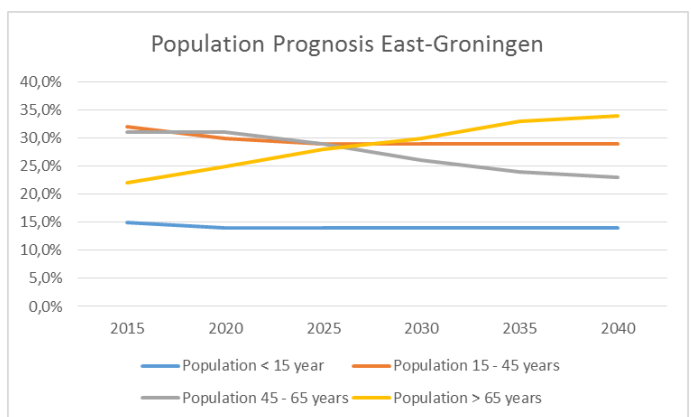


Figure 9: Population prognosis East-Groningen (ABF Research, 2014)

### 3.3.2 Households

The household prognosis of ABF research (figure 10) shows that the households in the Netherlands will grow from 7.5 million in 2014 to 8.5 million in 2040. This is an increase of 11.8% compared to the situation in 2014. The households in East-Groningen are expected to decline from 67,000 in 2012, 66,700 in 2014, to 59,000 in 2040. This is a decrease of 11.6% comparing the situations in 2014 and 2040 (ABF Research, 2014).

This results in a population and household decline in East-Groningen. The population will decline with 17.6% and the households will decline with 11.6%. This will result in a decline in the number of persons in a household and this leads to an increase of single person households. The number of elderly people (>65 years) will increase and all the other age groups show a slight decline compared to 2014. The 45-65 age group will decline rapidly from 31% to 23% of the population (ABF Research, 2014).

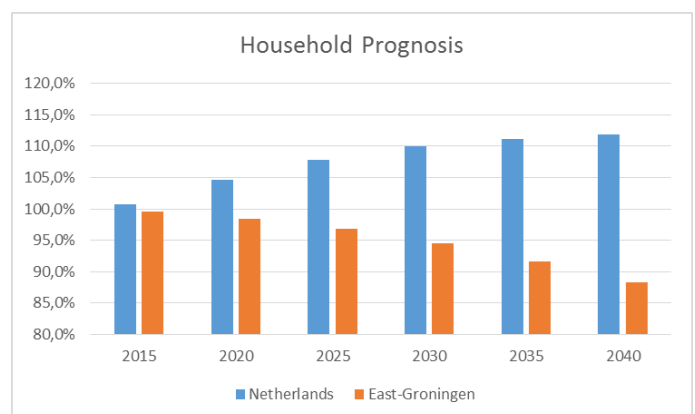


Figure 10: Household Prognosis (ABF Research, 2014)

### 3.3.2.1 Starters, transferring and other households

The demand in the owner-occupied sector (9,170 households) is divided into 1590 starting households (17.3%), 2,560 transferring households (27.9%) who leave an owner-occupied property behind and 54.7% (5,020 households) leaves a property in the area. The demand in the renting sector (8,070 households) is divided into 2,160 (26.8%) starters, 1510 (18.7%) migrants and 4,400 (54.5%) households that leave a property behind in the area (CitaVista, 2012).

### 3.3.3 Housing market

According to ABF research (2014) the housing stock in the Netherlands will grow from 7.5 million houses in 2015 to 8.4 million houses in 2040. (figure 11) This is an increase of 12% compared to the situation in 2014. This is compared to the expected growth of the households of 11.8% which is a necessary growth to keep up with the population and household growth.

In East-Groningen the housing stock is expected to decline comparing to the household and population decline. The Housing stock will decline from 68,200 houses in 2014 to 65,400 houses in 2040. This is a decline of 4 % comparing 2014 with 2040. This is not in line with the expected decline in households of 11.6%. Therefore this will lead to major problems in the housing market in this area. According to the prognosis of ABF there will be more houses (65,400) than households (59,200) in East-Groningen around 2040. This will lead to major vacancy and other social problems (ABF Research, 2014).

## 3.4 HOUSING STOCK

The housing market in the Netherlands consisted of 7.14 million houses in 2012. In East-Groningen this was 65,600 houses. There are 4.8 million single family properties in the Netherlands and this consists with 68% of the total stock. In East-Groningen this is 86% of the stock with 56,300 properties. This means that there are 18% more single family properties in East-Groningen than the Dutch average. This is possible because there is relatively a lot of space for a small number of people (CBS, 2015c)

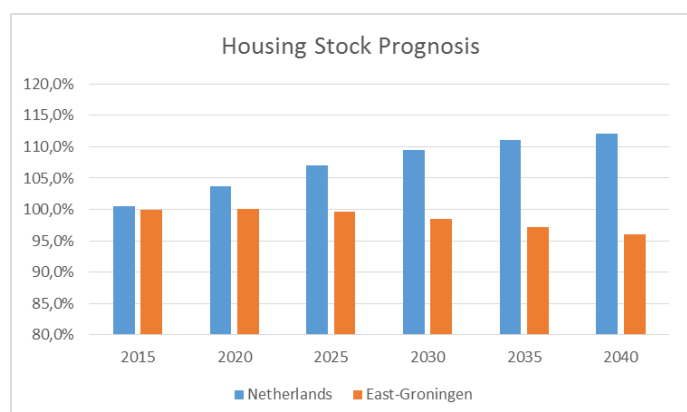


Figure 11: Housing Stock Prognosis (ABF Research, 2014)

The following sub-paragraphs explains the current<sup>3</sup> housing stock in the Netherlands and, as discussed earlier, the shrinking area of East-Groningen with a focus on the owner-occupied sector.

<sup>3</sup> The most recent definitive data of the housing stock from ABF Research and CBS are from the WOon 2012 research that is conducted every three years. Therefore the most recent data is dated in 2012.

### 3.4.1 Ownership

The housing stock can be divided into owner-occupied houses and social and private rented properties. Division of the ownership in the Netherlands and East-Groningen is visualized in figure 12. It is common in the Netherlands to buy a house and this is shown in the fact that 59% of all Dutch houses is being owner-occupied compared to 41% rent (divided into 77% social rent and 23% private rent). This means that of all 7.14 million houses 4.35 million houses are owner-occupied in the Netherlands (2.2 million social rent, 645,000 private rent).

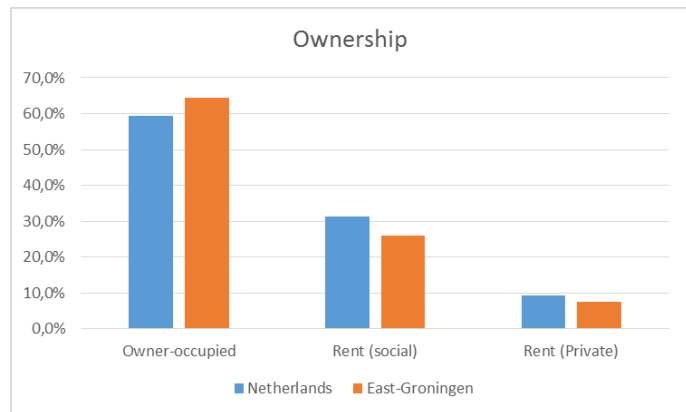


Figure 12: House ownership (BZK / CBS, 2012)

In East-Groningen the percentage of owner-occupied properties is higher than the Dutch average with 65% of the total stock, this equals with 42,400 houses. The 35% rented properties are divided into 74% (17,000) social rent and 26% (5,000) private rent (BZK / CBS, 2012). Therefore the focus in this research is on the owner-occupied housing sector in East-Groningen.

### 3.4.2 Housing type

There are 6 different housing types distinguished. The detached property, semi-detached property, corner house, terraced house, the flat and all other properties that do not fit any of these categories. As shown in figure 13 there are many more terraced houses and flats in the Netherlands, respectively 27% and 31.9% houses.

In East-Groningen most properties are detached with 31.6% or semi-detached with 22.9% of all properties in East-Groningen. This means that of all the different housing types, the houses in East-Groningen are more likely to be detached or semi-detached and in the Dutch average this is a terraced house or a flat (BZK / CBS, 2012).

The focus of this research is on owner-occupied properties, therefore figure 14 shows the division of the owner-occupied properties in East-Groningen and the Netherlands. Of the owner-occupied properties in East-Groningen 46% is detached and 23,8% is semi-detached (BZK / CBS, 2012).

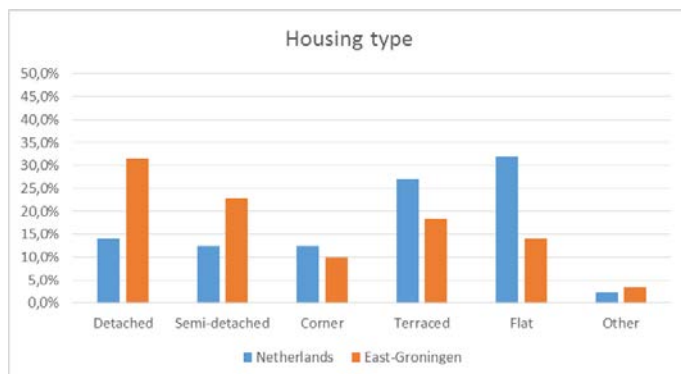


Figure 13: Housing type of all houses (BZK / CBS, 2012)

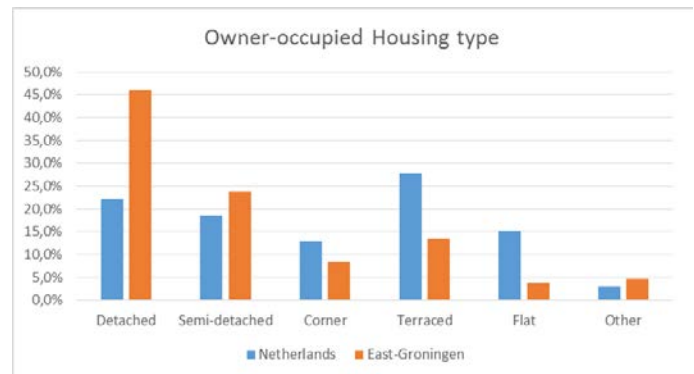


Figure 14: Owner-occupied Housing type (BZK / CBS, 2012)

### 3.4.3 Building period

The building period of the houses differ between East-Groningen and the Netherlands, see figure 15. In East-Groningen 29% of all houses were built before 1945, the Dutch average is 18.2% for this period. Between 1945 and 1975, 32.8% of the housing stock was built in East-Groningen, this is according to the Dutch average (33.6%). Between 1975 and 2000, 29.5% of the Houses was built in East-Groningen (NL: 35.7%). And after 2000 only 8.7% of the stock was built where the Dutch average is 12.4%.

Of the owner-occupied sector, 36.1% of the houses in East-Groningen were built before 1945 (NL: 20.8%). Between 1945 and 1975, 27.1% of the sector was built in East-Groningen and 28.3% in the Netherlands. And in the period 1975-2000 29.7% of the sector was built (NL: 36.9%). Between 2000 and 2012 only 7.1% of the owner-occupied houses in East-Groningen were built, compared to the Dutch average of 13.9%, this is a 6.8% difference (BZK / CBS, 2012).

The Housing stock overall and in the owner-occupied sector is older in East-Groningen than in the Dutch average. This is shown in figure 15 and 16, where there are significantly less houses built after 1975, than before this period.

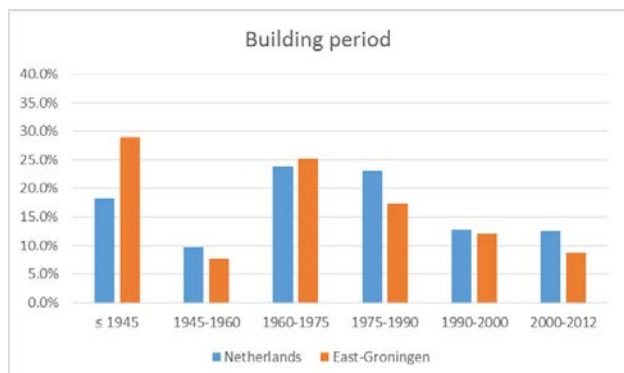


Figure 15: Building period (BZK / CBS, 2012)

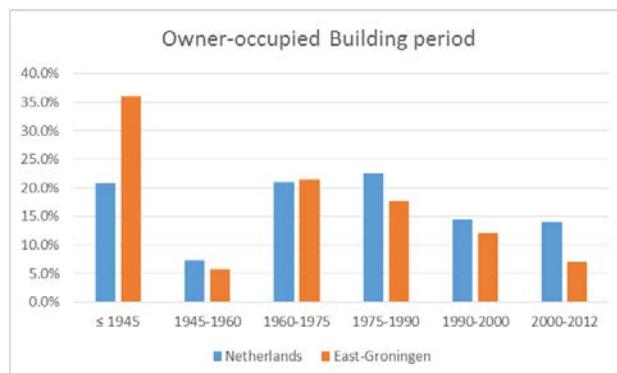


Figure 16: Owner-occupied Building Period (BZK / CBS, 2012)

### 3.4.4 Size

The size of a house can be expressed in square meters, see figure 17 and 18 for the national and East-Groningen situation and the owner-occupied sector of both situations. The houses in East-Groningen are relatively larger than the Dutch average: 18.6% of the houses in East Groningen is smaller than 75 m<sup>2</sup>, the Dutch average is ¼ properties. 23% of the houses in East-Groningen have 175 m<sup>2</sup> floor space or more and are large properties. The medium sized properties (75 – 125 m<sup>2</sup>) are comparable both the Netherlands and East-Groningen have around 35% of the building stock in this category.

In the owner-occupied sector the differences in size are smaller. Still a small difference can be seen in the smallest (< 75 m<sup>2</sup>) and the largest (≥ 175 m<sup>2</sup>) group. Where the houses in East-Groningen are larger (BZK / CBS, 2012).

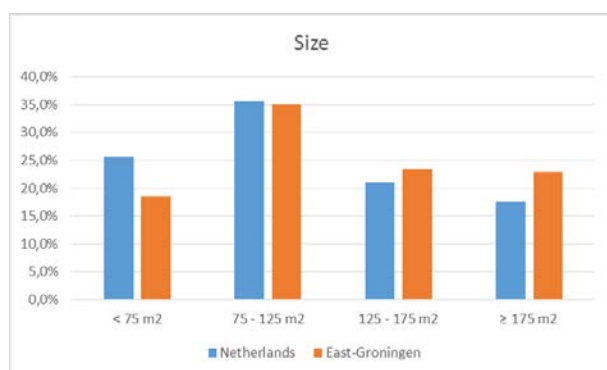


Figure 17: Size (BZK / CBS, 2012)

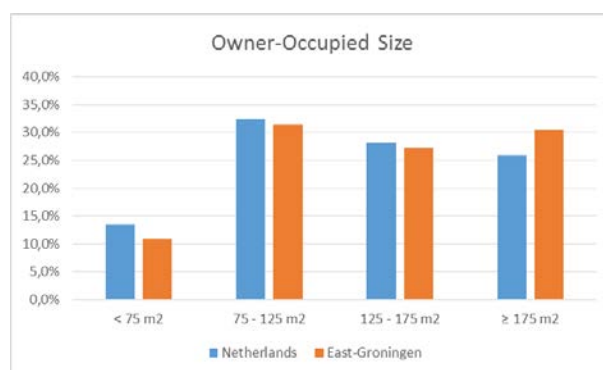


Figure 18: Owner-occupied size (BZK / CBS, 2012)

### 3.4.5 Price

The average housing price (WOZ-value) in the Netherlands is € 232,000 and in East-Groningen this is € 161,000 in 2012, this is only 69.4% of the value of an average Dutch house. In figure 19 the development of the housing prices in the Netherlands and East-Groningen is shown. The prices in 2012 are almost 3 times higher than in 2000. The largest prices rise happened between 2000 and 2005 with a rise from € 80,000 to € 200,000 for the Netherlands (25%) and a rise from € 57,000 to € 139,000 for East-Groningen (24.4%) (CBS, 2012e).

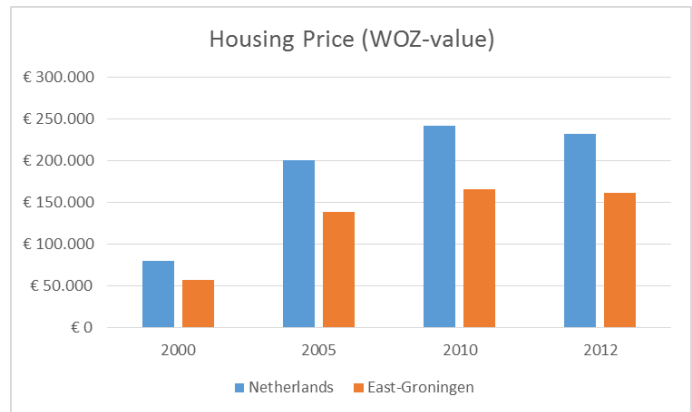


Figure 19: Housing Price (CBS, 2012)

### 3.4.6 Houses for sale

Of all 42,400 owner-occupied houses in East-Groningen. An average of 3000 houses are on sale in 2014. With a minimum of 2800 houses in December and a maximum of 3100 houses in the months: January, February, March, May and June. This is 7.2% of the owner-occupied housing stock in East-Groningen, this is 2.4% more than the Dutch average of 4.8% houses for sale in 2014 (CBS, 2014c). In figure 20 is the number of houses for sale compared to the total owner-occupied housing stock in 2014: 4.1 million houses in the Netherlands and 42,000 in East-Groningen.

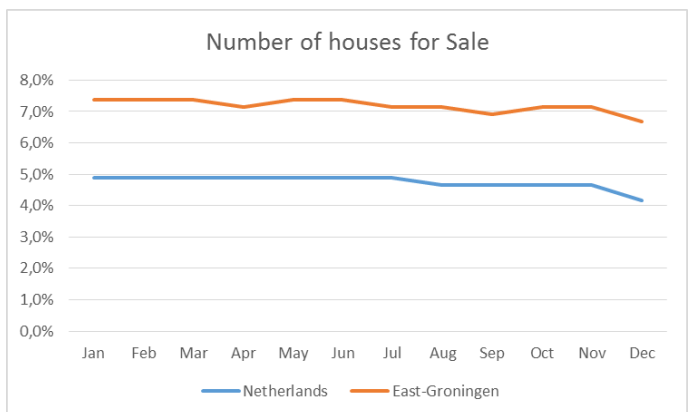


Figure 20: Number of houses for sale compared to housing stock (CBS, 2014)

The time it takes to sell a house is on average 7 months longer in East-Groningen (28.3 months) than in the Netherlands (21.4 months). In figure 21 you can see that the sales times increases during the year from 20 to 24 months for the Dutch average and 26 to 31 for the houses in East-Groningen. The average sales time over 2014 is 32% longer in East-Groningen than in the whole country (CBS, 2014c).

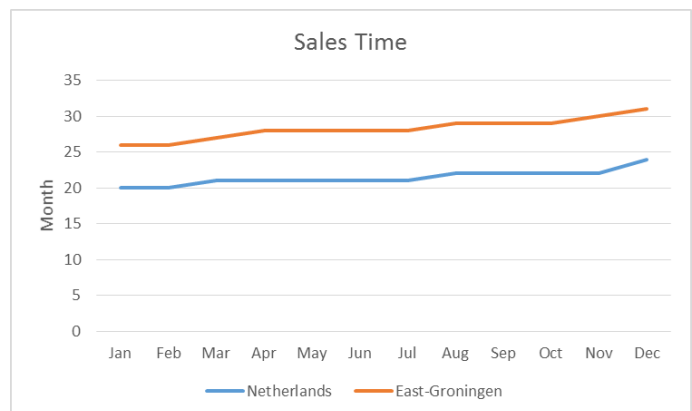


Figure 21: Sales Time in months (CBS, 2014)

The average asking price in 2014 is € 201,200,- in East Groningen this is 31% less than the Dutch average of € 292,800,- . In figure 22 is shown that the sales price in the Netherlands shows a slight growth during the year from € 293,000 to € 295,000 and the sales price in East-Groningen shows a decline of € 5.000 over the year. The price in East-Groningen drops from € 204,000 in January to € 199,000 in December (CBS, 2014c).

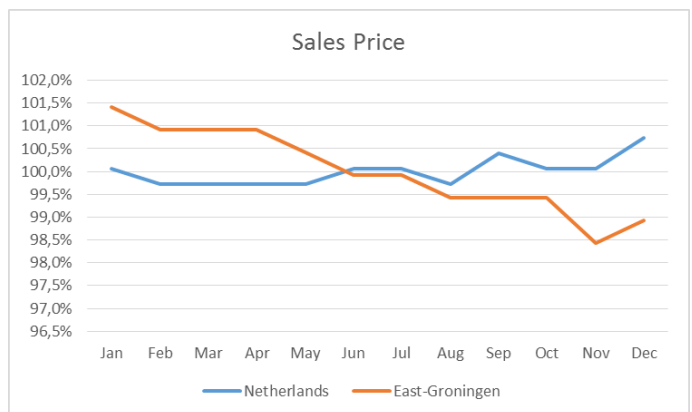


Figure 22: Sales price compared to 2014 average (CBS, 2014)

### 3.4.6.1 NVM DATA

The NVM (Dutch Real Estate Association) collects detailed data about houses which are for sale. 70 to 75% of all Dutch Real Estate Agents are aligned to the NVM, and their data is collected regularly.

In all 7 municipalities in East-Groningen data has been collected. In 2012, 1877 properties were for sale. 53% of these properties are detached houses. 20% are semi-detached and 17% are terraced or corner houses. The other 9% of the properties are flats. The average asking price decreased with 2.8% from € 174,500 in 2012 to € 169,500 in 2014 and the sales time increased over all sectors from 396 days in 2012 to 574 days in 2014. The largest increase in sales time is in the flat sector, (328-630 days) and the smallest increase in the terraced and corner houses (65 and 55 days respectively).

The larger housing sector +150m2 increased 1% in price during the period 2012-2014. But the small and the medium sectors decreased in price respectively 1 and 2.3%. The sales time increased in respectively the small, medium and large sector with 67%, 43% and 57%. From 336, 387 and 436 days to 561, 555 and 683 days. The data retrieved on request of the NVM can be found in Appendix II.

## 3.5 LOCATION

The 67 thousand houses in East-Groningen are divided over all 7 municipalities in this COROP area (green in figure 23). In the municipality of Oldambt are the most houses, 18,000 (26.6%) and in Menterwolde only 4,000 (6%) properties are present. This can be explained by the fact that the city Winschoten is located in Oldambt and Menterwolde is a rural municipality with Muntendam, a village of 4500 inhabitants, as main town. In table 1 the number of houses in the different municipalities is present.

In tables 2, 3 and 4 the average distance from the house to a supermarket, a basic medical facility and a primary school is presented (CBS, 2012c). The supermarket and primary schools are relatively close with a distance around 1 km as an average. The distance to a medical facility (general practitioner) is much further away with an average distance of 8.4 km.



Figure 23: Municipalities in the province of Groningen. Own editing

Table 2: Houses in East-Groningen

Number of houses	
Bellingwedde	4,090
Menterwolde	5,340
Oldambt	17,975
Pekela	5,485
Stadskanaal	15,060
Veendam	12,615
Vlagtwedde	7,070
total	67,635

Table 2: Distance to shops in East-Groningen

Distance to shops	
Bellingwedde	2.0 km
Menterwolde	0.8 km
Oldambt	1.2 km
Pekela	1.2 km
Stadskanaal	1.2 km
Veendam	1.1 km
Vlagtwedde	1.8 km

Table 3: Distance to medical facilities in East-Groningen

Distance to medical facilities	
Bellingwedde	10.2 km
Menterwolde	9.8 km
Oldambt	4.5 km
Pekela	7.2 km
Stadskanaal	5.2 km
Veendam	12.7 km
Vlagtwedde	16.7 km

Table 4: Distance to primary schools in East-Groningen

Distance to primary schools	
Bellingwedde	1.0 km
Menterwolde	0.8 km
Oldambt	0.9 km
Pekela	0.8 km
Stadskanaal	0.8 km
Veendam	0.8 km
Vlagtwedde	1.2 km

### 3.6 HOUSING PREFERENCES

The population in East-Groningen prefer a neighborhood with mostly single-family houses (40.7%) this is 5 percent more than the Dutch average and the type of the house itself is preferable detached (50.9%) this is almost double of the Dutch preference (27.8%). The highest preference of the Dutch population is a terraced house which is the preference of 32.4% of the potential movers (in East-Groningen this is 21.1% of the preferences). The housing preferences in this paragraph are measured by the WOON research (2012).

#### 3.6.1 House

The houses are preferred to be under € 200,000 in East-Groningen for 63.7% of the respondents. For all of the Netherlands this is 39.5% of the respondents. Only 9.1% of the population in East-Groningen prefers a house above € 300,000 this is almost 1/3 of the Dutch average (24.8%). In contrast to the price is the size preferred to be larger in East-Groningen. This could be because there is more space available per person, the space is cheaper and people can afford more square meters.

#### 3.6.2 location

The location of the preferred house of potential movers in East-Groningen is preferable in the present town (32.1%). Almost 30% of the people in East-Groningen wants to move definitely to another town, from the national respondents this is only 18.5% which is a difference of over 10% between the two different scales. This could be because the towns in East-Groningen are relatively small and there are less opportunities to find a house or other factors (e.g. current distance to supermarket, general practitioner or friends and family) are influencing the inhabitants to move.

#### 3.6.3 Neighborhood characteristics.

There is a slight preference in East-Groningen for a town with 20,000 – 50,000 inhabitants. 71% of the respondents chose this preference, however only 7 people answered this question, therefore this cannot be regarded as consistent data.

55.6% of the people who want to move in East-Groningen have a preference to live within 15 walking minutes of a city center, and 17.3% prefers to live in a rural area. This is in the Netherlands respectively 40.3% and 10%. 15.1% of the national respondents preferred to live in the city center compared to 6.2% of the East-Groningen respondents. It is clear that in East-Groningen most people like to live within walking minutes of a city center, and a small percentage actually wants to live in the center itself but a larger percentage would like to live in a rural area.

The location preference compared to a large city is that 32.1% of the people in East-Groningen prefer to live within 5.000 meter distance to a large city, 16% prefers a distance within 15 kilometers, 21% a distance within 30 kilometers and 8.6% prefers to live further away. In the Netherlands people want to live relatively closer to a large city with only 2.3% preferring to live further away than 30 kilometers and 10.1% that prefers 30 kilometers maximum. This can be explained by the fact that there are hardly any cities in the East-Groningen area.

#### 3.6.4 priority

The priority of the preference characteristics are shown below. For the first priority the house is most important, followed by the area and finally the price. This is for both East-Groningen and the Netherlands, where the priority for the house is slightly higher and the area lower for East-Groningen. For the second preference The price is most important followed by the area and the house.



### 3.7 WILLINGNESS TO MOVE

According to WOON (2012) 17,240 of 67,000 households are willing to move, this is 25.7% of all households in this area. This is divided into 4,920 (28.5%) households younger than 34, 9,140 (53%) between 35-64 years and 3,180 (18.4%) households are older than 65 year.

Of the households who are willing to move according to the WOON research 21.1% is single, 28% family without children, 37.8% family with children, 13% is in another category. And the households prefer a single family house (70.7%) which is an owner-occupied property (53%) (BZK / CBS, 2012).

### 3.8 CONCLUSION

The housing market is a complex market with various problems. The market is influenced on different levels, from the National housing policies to individual housing choices. Therefore, the focus in this thesis is on East-Groningen. Vacancy is necessary for a working housing market, however, structural vacancy will lead to problems and the owner-occupied sector needs to deal with a decline in sales prices.

In East-Groningen, 150,000 people live in 67,000 households in 7 municipalities. The prognosis is that the population will decline to 122,700 people in 2040. The housing stock in East-Groningen is expected to decline from 68,200 in 2015 to 65,400 in 2040. According to this prognosis there will be more houses than households, and this will lead to major vacancy.

The current housing stock in East-Groningen differs from the Dutch average in ownership, housing type, size, building period and price. Besides this is East-Groningen a rural area and the distance to shops, medical facilities, primary schools and friends / family is important for the housing choices.

Therefore more insight is needed on the housing preferences of people who want to live in East-Groningen. The focus will be on the largest housing sector in the area which is the owner-occupied sector. Research need to be conducted to know more about housing and location preferences and housing choice behavior of people living in East-Groningen. When the preferences and choices are known this can be used to solve problems with the housing stock and advice can be given to adjust the housing stock to the preferences of the owner-occupied sector in East-Groningen. In the following chapter the methodology is described that will be used to get more insight into the housing and location preferences.



## 4 METHODOLOGY

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In this chapter the methodology is described that will be used to analyze the complex housing choice decisions. The decision-maker has to consider multiple variables or attributes of the available alternatives at the same time. The decision maker needs to consider choosing an owner-occupied property or a rented dwelling, besides this the price, housing type, building period, size and the location is important. The location can be divided into distance to various factors such as primary schools, medical facilities, sport facilities, public transport, shops, friends and family. The general search area will be chosen for several reasons which include economical (distance to work) social (distance to friends and family) and practical issues (distance to shops). The complex housing decisions are researched by a stated choice experiment.

In this methodology chapter the stated choice method will be explained in the first paragraph, including the Random utility theory and the steps that need to be taken towards a stated choice experiment. In the following paragraphs the steps of the first paragraph will be elaborated and in paragraph 4.7 the Multinomial Logit and Latent Class models that are used to estimate the data collected by the stated choice experiment are explained.

### 4.1 STATED CHOICE METHOD

Stated choice method (SC) is a research technique in the family of stated preference methods (Shen, 2006). Stated choice methods are applied in many different fields (e.g. marketing, transport, housing). In stated preference studies information about decision makers' preferences is retrieved by using a specifically designed hypothetical situation (Shen, 2006). The decision maker is placed in a controlled experiment and asked to make hypothetical choices.

The SC method actually simulates consumer behavior in a controlled experiment and the SC method has a firm theoretical basis in Random Utility Theory, which is explained in paragraph 4.1.1. The stated preference data that is retrieved from a stated choice experiment has also several limitations, will the people do as they say? The decision maker may not know what they would do if a hypothetical situation were real. Or the respondents' idea of what they would choose might be influenced by factors that would not arise in real choice situations (e.g. their perception of what the researcher expects) (Train, 2009). It is possible to use revealed preference (RP) methods, where actual made choices are observed. Disadvantages of RP are that new alternatives cannot be taken into account, because they cannot be observed in advance, besides this revealed attributes are often correlated (Hensher et al., 2015).

Because of the controlled experiment and the theoretical basis a stated choice experiment is used to describe and predict housing and location preferences of people living in the shrinking area of East-Groningen. The data generated in a stated choice study is derived from a choice experiment. The steps of the stated choice experiment are explained in paragraph 4.1.2.

#### 4.1.1 Random Utility Theory

Stated choice experiments are based on a choice behavior theory. This theory was proposed by Louis Thurstone in 1927 and was called Random Utility Theory. The recent work of Stated Choice theory relies on work of McFadden, who extended Thurstone's original theory of paired comparisons to multiple comparisons (McFadden 1986 and Thurston 1927, cited in Louviere, Flynn, & Carson, 2010). Random Utility Theory (RUT) is associated with the design of the decision maker should try to choose the alternative that they like best. However a decision maker may not choose what seems to the analyst to be the preferred alternative, such variations in choice can be explained by a random element (Adamowicz, Louviere, & Swait, 1998). The utility function is:

$$U_{it} = V_{it} + \varepsilon_{it} \quad (1)$$

Where  $U_{it}$  is the overall utility of alternative  $i$  to the decision maker  $t$ ,  $V_{it}$  is the structural utility of alternative  $i$  for individual  $t$  and  $\varepsilon_{it}$  is the random element or the error term. The presence of this random component permits the analyst to make probabilistic statements about the decision makers behavior. When the utilities of multiple alternatives are estimated it becomes possible to compare each other (Nijënstein, 2012). The probability that a decision maker chooses alternative  $i$  over alternatives  $j$  can be written as the preferences for the greatest utility (McFadden, 1978; Train, 2009):

$$P_{it} = \text{prob}(U_{it} > U_{jt}), \forall i \neq j \quad (2)$$

Where  $P_{it}$  is the probability of decision maker  $t$  choosing alternative  $i$  out of the set of available alternatives. Several models can be used to estimate housing and housing location choice behavior. These models estimate part-worth utilities of all attributes which best reproduce the observed choice probabilities. The Multinomial Logit (MNL) and the Latent Class model are estimated (see paragraph 4.7).

#### 4.1.2 The stated choice experiment

Hensher, Rose and Greene made a summarization of the generation of a stated choice experiment. This summarization is shown in figure 24 and is used as a guideline.

- 1) Problem refinement. The process starts at the first stage with refining the problem. The problem during this research is to distinguish which owner-occupied properties can be taken out of the housing market. This is described in Chapter 3.
- 2) Stimuli refinement follows the problem refinement. The stated choice experiment is based on alternatives, attributes and levels. The most important attributes are used as input for the model, in order to make the questionnaire a reasonable length only the relevant and most important attributes are considered in the questionnaire.

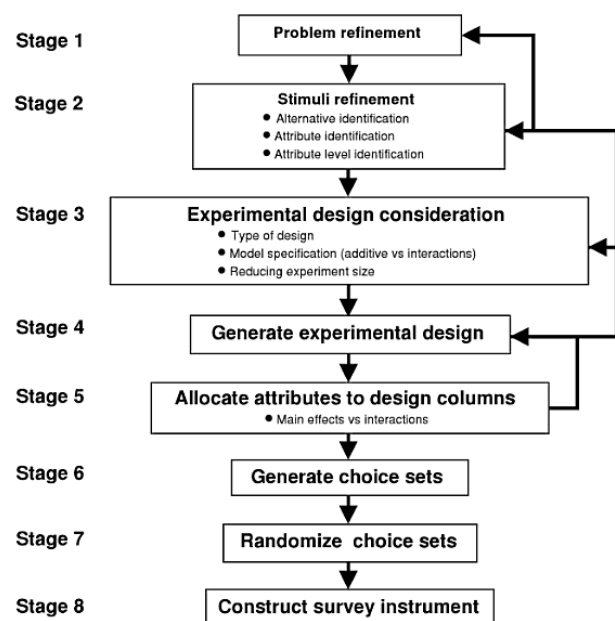


Figure 24: Guideline Stated choice (Hensher, Rose, & Greene, 2015)

- 3) Experimental design consideration. Several design characteristics have to be considered. Number of different classes of designs are available (a full factorial or a fractional factorial design), The coding format, the use of a labeled or a unlabeled experiments and the effects between attributes (Hensher, Rose, & Greene., 2005).
- 4) Generate experimental design. When all attributes are established the experiment can be created. The combination between the attribute levels has to be made, and need to be allocated to design columns. To be able to analyze the data it is required to code the attributes using orthogonal coding (Hensher et al., 2005).

At the end of the design process the choice sets are created and randomized. When the choice sets are complete and realized the survey will be prepared and distributed towards respondents. The following step is to collect all data from the completed questionnaires and processing this data. The data needs to be checked for correctness and all incorrect responses need to be removed.

After all data is collected two models will be estimated. The data will be estimated with the most common Multinomial Logit model (MNL) and the Latent Class (LC) model. The estimations of both models will be done for both housing and location preferences.

In the following paragraphs the different steps of the stated choice experiment will be explained. All steps are included from the problem refinement to the estimation of the models.

## 4.2 PROBLEM REFINEMENT

In several areas in the world, including the Netherlands, the population is shrinking. Due to this shrinkage, problems on the housing market occur (Chapter 3). Therefore it is important to understand the housing preferences of the population which is staying behind. These preferences will be researched through a stated choice experiment.

For this research an empirical study is conducted. The study is focusing on the Northern COROP region of East-Groningen in the Netherlands, which consists of 7 municipalities (Menterwolde, Bellingwedde, Oldambt, Pekela, Stadskanaal, Veendam and Vlagtwedde).

## 4.3 STIMULI REFINEMENT

The stated choice experiment is based on attributes and attribute levels. In this paragraph the attributes that will be used in the experiment are elaborated. Opoku and Abdul-Muhmin (2010) state that numerous specific housing attributes and house purchase factors have been suggested in the literature as influencing people's housing choice. These range from intrinsic housing attributes such as cost and size through extrinsic attributes such as exterior design and exterior space to neighborhood and other locational factors such as pollution.

The housing choice decision is complex and involves many attributes. The attributes in this experiment are derived from a literature study. The attributes can be divided into two main categories: the housing attributes and the location attributes. The findings from the literature study combined with the input of experts of KralWesten Real Estate in Stadskanaal represent the input for the experiment. The list of attributes is reduced to only the most important attributes.

The selected attributes that are used in the experiment are presented in table 5 and 6. The attribute levels represent the levels assigned as part of the experimental design process. The levels are represented by numbers that have no meaning to the decision-maker. Therefore attributes levels labels are assigned to the levels. In total there are 10 different attributes, divided into two different sets: The first set is about the house and the second set is about the housing location.

Table 5: Housing Attributes

Attribute	Level	Labels	Explanation
1 Price	0	€ 125,000	Price of the property including garden.
	1	€ 175,000	
	2	€ 225,000	
2 Type	0	Detached House	Free standing property, garden all around.
	1	Semi-Detached House	Two properties connected.
	2	Terraced / Corner House	Three or more properties connected in a row.
3 Size	0	Small (75 m <sup>2</sup> )	Average house size.
	1	Medium (125 m <sup>2</sup> )	
	2	Large (175 m <sup>2</sup> )	
4 Building year	0	Before 1945	Approximately building year before WOII.
	1	1945 - 1990	Approximately building period
	2	After 1990	Approximately building period
5 Single floor	0	Yes	Living area, kitchen, bathroom and bedroom on 1 floor
	1	No	living area, kitchen, bathroom and bedroom are not on the same floor.
	2	No, but easy to adjust	Living area, kitchen, bathroom and bedroom are easily made on the same floor.

Table 6: Location Attributes

Attribute	Level	Labels	Explanation
1 Urbanism	0	In a Village	> 1000 adresses per km <sup>2</sup>
	1	At Village border	500-1000 adresses per km <sup>2</sup>
	2	In Rural area	< 500 adresses per km <sup>2</sup>
2 Distance to Shops (Supermarket)	0	1 km	Distance to supermarket
	1	5 km	
	2	10 km	
3 Distance to Medical facilities	0	1 km	Distance to general practitioner
	1	5 km	
	2	10 km	
4 Distance to Schools (primary)	0	1 km	Distance to primary schools.
	1	5 km	
	2	10 km	
5 Distance to Friends / Family	0	1 km	Distance to nearest friends and or family
	1	5 km	
	2	10 km	

#### 4.3.1 Housing attributes

The first five sets of attributes are about housing and are divided into price, housing type, housing size, building year and whether it has all important rooms on a single floor.

**1. Price:** The price is always important in product selection. The housing price is sticky correlated with the location, partly due to land prices. The prices are based on market research with data of CBS (Dutch statistical agency) and the NVM (Dutch association of real estate agents). By using the data and the knowledge of experts in the field the following distribution can be made (CBS, 2012e; BZK / CBS, 2012; NVM, 2015):

- 0) € 125,000
- 1) € 175,000
- 2) € 225,000

**2. Type:** The type of houses is a select group. In this research detached houses cover almost half of the housing stock in the area, and apartments are rare. People seem to prefer a land based property. Therefore the three levels that are used are all land based, and differ in amount of freedom. From a detached house (no direct neighbors), semi-detached property (2 houses connected) to a terraced or corner house (three or more houses connected). The three used labels are:

- 0) Detached House
- 1) Semi-Detached House
- 2) Terraced / Corner House

**3. Size:** The housing size is divided into three different levels. Small, Medium and Large. The labels are adjusted to the average surface area in East-Groningen. The sizes are:

- 0) Small (75 m<sup>2</sup>)
- 1) Medium (125 m<sup>2</sup>)
- 2) Large (175 m<sup>2</sup>)

**4. Building year:** The Building year of the property gives a lot of information about the building. Three levels are distinguished. The first levels contains houses build before the second world war (1945). The second level is between 1945 and 1990. And the third level can be seen as a relatively newly build property from after 1990. The three levels are:

- 0) Before 1945
- 1) 1945 - 1990
- 2) After 1990

**5. Single floor:** The number of floors in an house could be important. There are three levels, at the first one the living room, kitchen bath and bedroom are on one single floor and can be reached without using the stairs. At the second level the house is divided over two or more levels and at this level the bedrooms are likely to be upstairs. At the third and final level the house can easily be adjusted to a single floor property by modifying the ground floor, by adding a bath or bedroom on this level. The three levels are:

- 0) Yes
- 1) No
- 2) No, but easy to adjust

#### 4.3.2 Location attributes

The second set of attributes concern the housing location 5 different attributes are selected: level of urbanism, distance to shops for daily groceries, distance to medical facilities, distance to primary schools and distance to friends and/or family.

**1. Urbanism:** The level of urbanism is divided into three labels. The labels are set by the standard of the Dutch statistical agency, and are divided between the number of addresses per square kilometer. There are three different levels, at the first one there are more than a 1000 addresses per square kilometer, and this could be seen as in a village center. The second level is 500-1000 addresses and this is likely to be at a border of a town. And the third and final level is the rural area with less than 500 addresses per square kilometer. The three labels are:

- 0) In a Village
- 1) At Village border
- 2) In Rural area

**2. Distance to shops:** The distance to shops, is the distance for the daily groceries. The supermarket baker or butcher. There are three different levels of distances. 1 kilometer likely to be walking distance, 5 kilometer which is a distance that can easily be covered by bike, and 10 kilometer which is likely to be done by car.

- 0) 1 kilometer
- 1) 5 kilometer
- 2) 10 kilometer

**3. Distance to medical facilities:** The distance to medical facilities is the distance to a general practitioner or a pharmacy. Here are also three different distances to be covered by either walking cycling or driving.

- 0) 1 kilometer
- 1) 5 kilometer
- 2) 10 kilometer

**4. Distance to primary schools:** The distance to schools is important for families with young children. The distance is measured to primary schools, because smaller children are unable to travel to school by themselves. There are also three distances, walking, cycling and car. Which are divided into:

- 0) 1 kilometer
- 1) 5 kilometer
- 2) 10 kilometer

**5. Distance to friends and or family:** The distance to friends and family is an important attributes concerning the social life. The distance is also in the same three different distance categories.

- 0) 1 kilometer
- 1) 5 kilometer
- 2) 10 kilometer

#### 4.4 EXPERIMENTAL DESIGN

When all attributes and attribute levels are known, experimental design decisions need to be made. As you can see in the paragraph above there are 2 sets of 5 attributes presented. This could be managed as 1 experimental design with 10 attributes. The reason to combine both sets is the connection between the location and the house, but making a choice over all attributes will lead to extensive decision making over alternatives with 10 attributes each. Therefore the two sets are divided into two different experiments with 5 attributes each (housing and location). Dividing the attributes in two different sets could be used to ask both sets to all respondents. By doing so fewer respondents are needed to obtain significant results.

##### 4.4.1 Labeled or Unlabeled experiment

First of all the analyst needs to decide to use a labeled or an unlabeled experiment. For example when a person chooses between a Toyota or a Volkswagen car, instead of Car 1 and Car 2. According to Hensher et al. (2015) adding a label could be seen as a constant attribute for that alternative. This could lead to problems in terms of meeting the IID model assumption (alternatives used in the modeling process need to be uncorrelated). A benefit of using unlabeled experiments is that they do not require the identification and use of all alternatives within the universal set of alternatives. Therefore the experiments in this research are unlabeled. The labels used are: House and Location.

##### 4.4.2 No choice

Decision makers should not be forced to make a choice among the alternatives. Forcing respondents to select a choice from the presented alternatives leads to overestimated results (Hensher et al., 2015). Therefore a no preference or base alternative (Geen van deze woningen) is added.

##### 4.4.3 Full factorial design

The most straightforward way of an experimental design is the full factorial design (Wang & Li, 2002) (Hensher et al., 2015). This design generates all possible combinations of attributes and levels. For this research with 5 attributes with 3 levels each, it will be  $L$  to the power of  $x$  combinations with  $L$  the number of levels and  $x$  the number of attributes. Therefore it will be a design of  $3^5 = 243$  combinations for the location and the housing each or  $3^{10} = 59.049$  combinations when both the location and housing are used together in one design.

59 thousand and even 243 treatment combinations are too many to handle in this relatively small research, therefore a fractional factorial design will be used. This is a design type that uses a fraction of the full factorial design. However the used design will still be orthogonal. In order to ensure that the estimation of model parameters is unbiased and efficient, orthogonal designs extract a fraction of the profiles of the full factorial design in which the attribute arrays are orthogonal and the attribute levels are balanced. Orthogonality is a mathematical constraint requiring that all attributes be statistically independent of one another. All attribute levels need to appear an equal number of times over the design, and it implies zero correlations between attributes (Wang & Li, 2002; Hensher et al., 2015).

#### 4.4.3.1 Fractional factorial design

A fractional factorial design is used, to determine the minimum number of treatment combinations necessary for such a design, an orthogonal fractional factorial design was used. The design that was used was retrieved from the design index of Hahn and Shapiro (1966). The experimental plan code number used is 18b, this plan uses 5 variables with three levels each. This leads to 27 tests that are required to generate the design. In the design there are 3 independent two-factor interactions under the assumed model. The 27 tests are taken from masterplan 8, and the 5 variables are taken from the columns 1, 2, 5, 10 and 13 (Hahn & Shapiro, 1966). These 27 tests or treatment combinations are far less than the 243 that are used by the full factorial design.

## 4.5 GENERATED DESIGN

The same design of Hahn and Shapiro is used twice to use both the housing and the location attributes. Therefore all 5 housing and location attributes are assigned to a separate column of the table of Hahn and Shapiro (1966). The 27 rows correspond with 27 different profiles that are orthogonally distributed. All attribute levels occur an equal number of times, in this design all attribute levels are present 9 times.  $9 \times 3$  levels equals 27 profiles. The different profiles can be found in appendix III.

The coding will be transferred to orthogonal coding with orthogonal coding the three levels will be shown with -1, 0 and 1. Due to the orthogonal design every column adds up to 0. By using the predefined orthogonal design of Hahn and Shapiro the amount of information retrieved is optimized and correlations are minimized to zero (Hahn & Shapiro, 1966).

Table 7: Choice Sets

Choice Set	Set	Alt. 1	Alt. 2	Alt. 3
1	1	1	24	11
2	1	2	16	25
3	1	3	23	10
4	1	4	21	22
5	1	5	19	13
6	1	6	18	17
7	1	7	20	12
8	1	8	14	26
9	1	9	15	27
10	2	10	24	8
11	2	11	6	27
12	2	12	3	23
13	2	13	2	22
14	2	14	4	7

#### 4.5.1 Choice sets

The 27 profiles are diffident in 3 alternative columns. This results in 9 choices sets of 3 different alternatives. Combined this will be 1 set. Various sets are created, in total there are 10 different randomized sets of 9 choice sets each (an example of a set is shown in table 7). To overcome possible biases from order effects, the order of appearance of these choice sets is randomized across the experiment shown to each respondent (Hensher et al., 2015). Every set that is shown to 1 respondent contains 9 different choice sets with 3 alternatives each, in the set all the 27 different profiles are used. Every choice set is completed with a no choice alternative, If the respondent has no preference it can choose the base alternative (Geen van deze woningen). An example of a generated choice set is shown in figure 25. All the generated choice sets can be found in appendix IV.



Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 175.000	€ 125.000	€ 125.000	
Woningtype	Vrijstaand	Rij-/Hoekwoning	Vrijstaand	
Grootte	Groot (175 m2)	Groot (175 m2)	Groot (175 m2)	
Bouwjaar	Voor 1945	1945 - 1990	Na 1990	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee (wel gelijkvloers te maken)	Nee (wel gelijkvloers te maken)	Nee	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wilt u deze woning kopen?	Ja <input checked="" type="radio"/>	Nee <input type="radio"/>		

Figure 25: Example generated choice set

## 4.6 QUESTIONNAIRE DESIGN

When the stated choice experiment design is complete a questionnaire can be constructed. The choice sets of the housing choices and the location choices are added to the online survey tool of the Department of Built Environment of the University of Technology in Eindhoven: the Berg Enquête Systeem. This computer based survey tool has the advantage of facilitating the process of data recording and the creating of a database.

The survey focuses on the owner-occupied housing market in the shrinking area of East-Groningen. Everyone who is willing to move to an owner-occupied property in one of the 7 municipalities of East-Groningen is a potential respondent. At the start of the survey additional information about the research and researcher is given, as well as information about the length of the questionnaire.

The introduction is followed by general questions about the respondent, its household and their current housing situation. The questionnaire is anonymous but in order to compare the results with other socio demographic groups, national data specific information about the respondent is asked.

After the general questions in the first part, a total 18 different choice sets will be shown to the respondent. This is divided into 2 sets, each with an example question. Prior to the choice sets general information about the questionnaire is presented to the respondent, and general questions about the respondent are asked.

The questionnaire including the general questions and an example of the choice sets is added in appendix V.

### The sample size.

As a rule of thumb, McFadden (1984) proposes, "sample sizes which yield less than thirty responses per alternative produce estimators which cannot be analyzed reliably by asymptotic methods." Therefore 40 responses per alternative is preferred.

## 4.7 ANALYZING MODELS

For housing choice behavior Multinomial Logit (MNL) models are used most often (Haaijer, 1999). The Multinomial Logit model (MNL model) is the standard model for analyzing discrete choices, and can be derived from utility maximization. (Hensher et al., 2015) Besides the MNL model the more advanced Latent Class model is estimated.

### 4.7.1 Multinomial Logit

The Multinomial Logit model (MNL model) is the, most widely used, standard model for analyzing discrete choices. The MNL model can be derived from utility maximization. The MNL model was derived from assumptions about the independence from irrelevant alternatives (IIA) property and the model assumes the Independence of Identically Distributed (IID) error components, this implies that there are no common unobserved factors affecting the utilities of the various alternatives. Together do these two assumptions allow for ease of computation, and they provide a closed form solution (Koppelman & Bhat, 2006; Hensher et al., 2015).

The closed form MNL model is therefore:

$$P(i) = \frac{\exp(V_i)}{\sum_{j=1}^J \exp(V_j)} \quad (3)$$

Where the structural utility ( $V_i$ ) is used to calculate the probability of alternative  $i$  being chosen out of  $j$  alternatives by a decision-maker.

The Multinomial Logit model represents the preferences of all respondents by one set of utility weight parameters. The MNL model does not accommodate for heterogeneity of consumer choice behavior and potentially suffers from the Independence of Irrelevant Alternatives (IIA) property. This may be restrictive in many practical situations (Gustafsson, Herrmann, & Huber, 2007; Louviere, Hensher, & Swait, 2000).

### 4.7.2 Latent Class

Latent Class models assume that homogeneous preference classes exist, which can be identified based on the observed choices. The Latent Class (LC) model takes heterogeneity into account by grouping respondents in different segments. It is proposed that heterogeneity among individual behavior varies with factors which are unobserved by the researcher. This results into undefined and unknown classes beforehand, the classes are based on the data gathered (Nijenstein, 2012).

The researcher determines the number of Latent Classes and a separate model is estimated for each of these classes together with a probability for every respondent of belonging to each of these classes (Jansen, Coolen, & Goetgeluk, 2011). Respondents who have similar observed variable distributions are grouped into the same Latent Class with parameters to be estimated. Usually, not all respondents belong exactly to one group, therefore, LC models take into account the uncertainty of a persons' groups membership.

Latent Classes can be used when discrete heterogeneity is present in the population: multiple homogenous groups can be specified with each group having its own choice behavior (Nijenstein, 2012).

## 4.8 CONCLUSION

The method that is used to estimate the complex housing choice decisions is a stated choice method. This method is based on the Random Utility Theory. The multiple variables which a decision maker takes into account are used to set up a stated choice experiment. This experiment will be used to describe and predict housing preferences of people living in the shrinking area of East-Groningen.

The stated choice method is used to place the decision maker into a controlled experiment. The method is explained step by step, from the problem refinement, stimuli refinement (including the elaborated attributes and attribute levels) to the construction of the experiment. There are 5 housing attributes and 5 location attributes with 3 levels each used. In total 27 different housing and 27 different location profiles are constructed which are divided into 9 choice sets with 3 profiles each, in every choice set a base alternative was added. The choice sets are randomized and included into a questionnaire which was created with an online survey tool.

The collected choice data will be analyzed by using two different models, the Multinomial Logit and the Latent Class model. The MNL is computationally simple and is widely understood and used in practice. This model, however, does not take heterogeneity into account. The other model does take into account heterogeneity. This will be tested with different segments in the housing market with different preferences.



## 5 RESULTS

The housing market in East-Groningen has various problems. The prognosis will be that in 2040 the huge difference between houses and households will lead to major vacancy. The current housing stock needs to be adjusted to the preferences of the people in East-Groningen. The housing and location preference and choice behavior is researched. In this chapter the preferences and choices are compared to the current housing stock to see whether the owner-occupied sector still meets the needs of the customer in East-Groningen.

The results are divided into five different parts: data collection, respondents characteristics, current housing situation of the respondents, the willingness to move and the model estimation which is divided into a Multinomial Logit model and a Latent Class model.

### 5.1 DATA COLLECTION

The data was gathered using the Berg Enquête System ©2007. This is an online survey tool of the Built Environment Department of the TU/e. The survey was open to the public from Monday September 14<sup>th</sup> 2015 to Friday October 2<sup>nd</sup> 2015. The questionnaire was accessed 333 times within these 3 weeks. In total 149 respondents answered at least one question, but of these 149 only 88 completed the questionnaire, leading to a response rate of 26.4%.

All incomplete questionnaires were rejected including the questionnaires where the respondent stopped after the first set of housing choices. Three respondents filled out an unknown ZIP code. These respondents however did complete the questionnaire, and therefore their data is included into the analysis. Only the present housing situation cannot be analyzed.

The data is downloaded from the Enquête system in SPSS format. The SPSS data was split into three files: the general household questions, the housing preferences and the location preferences. The last two files were exported to excel and converted into effects coding, the coding scheme is present in table 8.

Table 8: Effects coding

Attribute level	Price1	Price2
Low	0	1
Medium	1	0
High	-1	-1

An advantage of effects coding is that the estimated utility constant can be interpreted as the average utility attached to the alternatives included in the experiment (Jansen et al., 2011; Bech & Gyrd-Hansen, 2005). With effect coding the three attribute levels are transformed into L-1 variables (e.g. Price1, Price2). The level is set equal to 1 when the level is present, 0 when not present and -1 when the reference level is present. The estimated coefficients are used to calculate the part-worth utility of each level by multiplying the estimated parameter with its code and summing the results across the coded columns (Hensher et al., 2015). For the high attribute level this is:

$$V_i = \beta_0 + \beta_{price1} \times (-1) + \beta_{price2} \times (-1) \quad (4)$$

Where  $V_i$  is the response variable,  $\beta_0$  is a parameter not associated with any of the observed and measured attributes, called the alternative specific constant, which represents on average the role of all unobserved sources of utility and  $\beta_{price1}$  and  $\beta_{price2}$  are the estimated parameters (Hensher et al., 2015).

Every choice possibility of all respondents that fulfilled the questionnaire is allocated to a separate row, all using effect coding. This leads to  $88 \times 9 \times 4 = 3168$  individual rows. This is including the no choice alternative that is included into every question. These 3168 rows is only for one of the two choice sets. So in total 6336 rows of data was gathered for the housing and the location preferences.

## 5.2 RESPONDENTS CHARACTERISTICS

Of all 88 respondents 42 were men and 46 woman, resulting in 47,7% male respondents and 52,3% female respondents. The age of the respondents differs from the average age of the population in east Groningen, see table 9. This is due to several factors. First of all the questionnaire needed to be filled in by people who want to move to an owner occupied property. Children under 15 years old generally live with their parents and do not decide themselves to move, therefore there is no response rate below 15 years old. The respondents are generally between 15-45 (50%) and 45-65 (38.4%) years old.

Table 9: Respondents age and gender

Age	Respondents		East-Groningen	
	Men	Women	Men	Women
< 15	0.0%	0.0%	7.8%	7.5%
15 - 45	23.3%	26.7%	16.6%	15.6%
45 - 65	16.3%	22.1%	15.4%	15.1%
> 65	8.1%	3.5%	10.1%	12.0%
total	100.0%		100.0%	

The overrepresentation of these groups could have occurred due to the fact that the questionnaire was mainly distributed digitally instead of on paper. The respondents between 15-45 years old are almost evenly distributed between men and women, between 45-65 year old are mainly woman (22.1% / 16.3%) and the eldest group are mostly men (8.1% / 3.5%)

The education of the respondents is mainly Intermediate vocational education (MBO) (37,5%) or Higher professional education (HBO) (29,5%). Taking in consideration the different age groups, the elderly people (> 65 years) are less educated compared to the two younger groups present. 50% of the elderly people indicate Senior general secondary education as highest level of education, of young adults (15-45 years) this is 16.3% and of the adults (45-65 years) 30.1%.

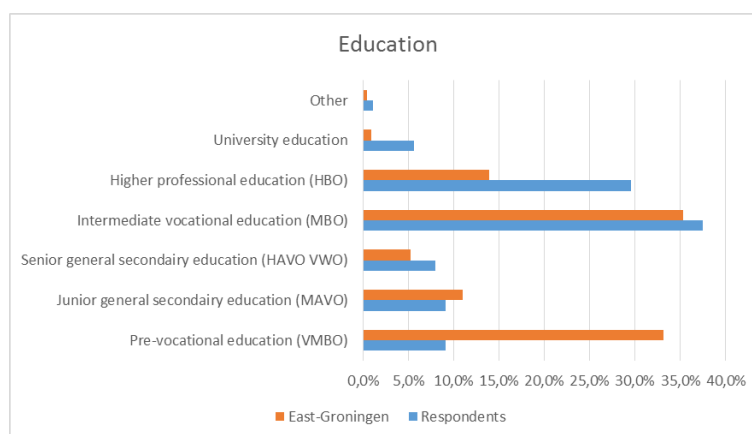


Figure 26: Education of respondents

The young adults are mainly educated through intermediate vocational education (MBO) (34.9%) or higher professional education (HBO) (39.5%). The adults have mainly followed MBO (45.5%).

The respondents with pre-vocational education (VMBO) are diminished represented (9%) compared to the highest level of education of the people in East-Groningen (32%), see figure 26.

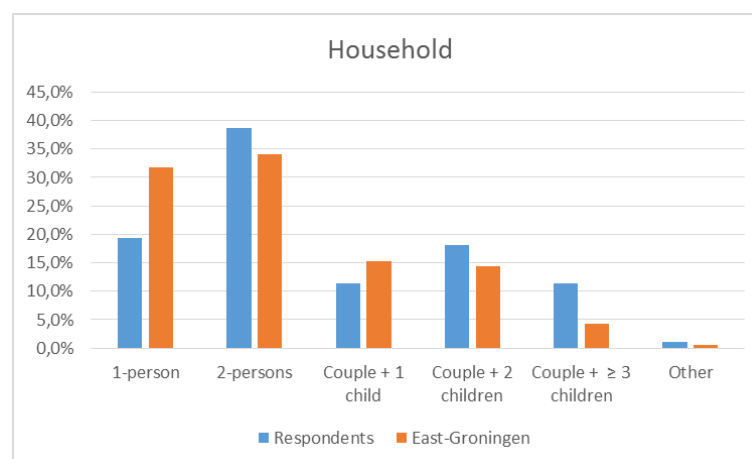


Figure 27: Household of respondents

The households of the respondents are slightly different from the households in the area. There are less single person households that completed the questionnaire and slightly more couples with two or more children, see figure 27.

Unfortunately, the differences between the respondents and the population is the result of a non-representative sample of the population. The differences between the respondents and the population of East-Groningen leads to a reduced external validity of the results.

### 5.3 CURRENT HOUSE AND LOCATION

83% of the respondents lives in an owner-occupied property, this is much more than the average of 59% in East-Groningen. This could be because of the focus of the research being the owner-occupied sector. Of this 83% most people (61.6%) live in a property valued above € 175,000. This is higher than the average housing value of € 161,000 in the area. The current housing situation of the respondents is shown in appendix VI.

The majority of the respondents (46.6%) lives in a detached property, followed by 22.7% in semi-detached houses and 18.2% lives in a terraced or corner house. This is comparable to the distribution of the owner-occupied housing types present in the area. The housing size of the respondents is comparable to the distribution in East-Groningen (see figure 18 in chapter 3). The largest difference is in the second largest group, 36.4% of the respondents indicate to live in a property of 125 to 172 square meters compared to 27% of the owner-occupied properties present in East-Groningen.

The building period of the current properties is newer for the respondents than the average in East-Groningen. Only 22% of the respondents indicate a building period before 1945, this is low compared to the average of 36.1% in the area. The building period after 1990 was indicated by 36% of the respondents, this group of respondents is relatively large compared to the actual number (22%) of houses which were built in this period.

#### 5.3.1 Current location

The current location of the houses of the respondents is shown in figure 28. 76% of the respondents indicates to live in East-Groningen. The other 24% is mainly (50%) from other parts of the province of Groningen and from the province of Drenthe. The Respondents from East-Groningen are mainly from the municipality of Oldambt (21,6 %), Ter Apel (20,5 %) and Pekela (15,9%).

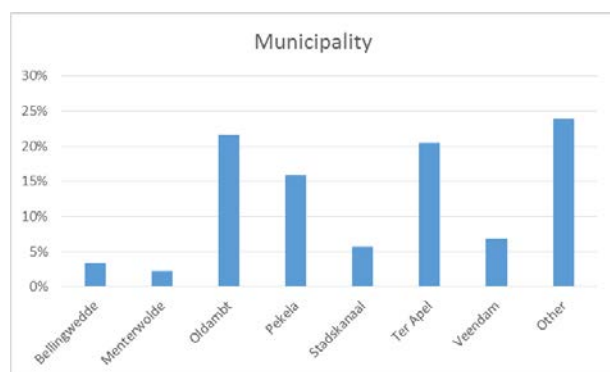


Figure 28: Municipality of respondents

The three larger towns Veendam, Stadskanaal and Winschoten are present with respectively 7.5%, 4.5% and 17.9% of the respondents. Borgercompagnie (1.5%) is the smallest town present in the sample with 430 inhabitants, this town can be found in the municipality of Veendam. An overview of the respondent locations in East-Groningen is present in appendix VII.

The distance to shops, medical facilities, primary schools and friends / family of the respondent is present in appendix VII. The local distance to shops such for example a supermarket is mostly between 500 meter and 5 km (36.4% + 35.2%). This is comparable to the average distance of 1.3 km to a supermarket.

The distance to simple medical facilities is not representative in the sample. 93% of the respondents indicate to live within 5 kilometer distance to a medical facility, where the average distance is 8.4 kilometer in the area with large differences between the different municipalities (e.g. 4.5 km in Oldambt and 16.7 km in Vlagtwedde).

The distance to primary schools is for 46.6% of the respondents max 1 km distance. This is comparable to de average distance of 900 meters in East-Groningen. Almost all respondents (97,7%) live within 5 km distance of friends and or family. This indicates that the respondents find it important to live close to relatives and friends.

There are slight differences between the housing and location characteristics of the respondents and the population. The building year and the distance to medical facilities is not representative in the sample compared to the current housing stock in East-Groningen. The difference is a result of a non-representative sample of the population. The differences between the respondents and the population of East-Groningen leads to a slightly reduced external validity of the results.

## 5.4 WILLINGNESS TO MOVE.

The research is distributed along people who are supposed to be willing to move. When a person indicates that he is not willing to move, this person is not active on the housing market, this could reflect on the choices that are made. However it is possible that the respondent is not willing to move within the next two years, but that he is looking further ahead.

32.2% of the households in East-Groningen is willing to move within the next two years according to the WOON research (2012). Of all respondents, 36.4% is willing to move to an owner-occupied property and 5.7% prefer to move to a rental property. From the respondents that are willing to move 86,5% prefers an owner-occupied property.

The respondents who are not willing to move were not deleted from the population, because respondents could be willing to move in the future (after 2 years) and it is uncertain if the respondents' choices are influenced by the willingness to move.

## 5.5 MODEL ESTIMATION

The model estimations of the stated choice experiment are discussed. The Multinomial Logit and Latent Class model will be discussed into the following paragraphs.

### 5.5.1 Multinomial Logit model

Estimations of the MNL model in NLogit 5.0 are examined. The results are shown in table 10 and 11. The estimates in these tables show the preferences for the attribute levels. A higher  $\beta$ -estimate indicates a stronger preference. The estimations of the attribute levels are calculated by effects coding as explained in paragraph 5.1.

The  $\rho^2$  of McFadden is used to measure the goodness of fit. The  $\rho^2$  gives a value between 0 and 1. Where 1 indicates a perfect model of fit and 0 indicates that the estimated model is no better than the model with zero parameters (Train, 2009).  $\rho^2$  is 0.17 for the housing preferences and 0.03 for the location preferences. This indicates not an excellent fit, but a sufficient fit for the housing and the location model is considered weak ( $\rho^2$  between 0.2 and 0.4 is indicated as excellent fit, and models below 0.1 are considered weak (McFadden, 1978)). The 'constant' variables of -0.08 and 0.45 indicate that respondents rather choose a housing or location alternative than the no preference option.



Table 10: MNL Housing choice

Multinomial Logit			
Variable		$\beta$	p
Constant		-0.07968	0.39
Price	<b>€ 125,000</b>	<b>0.42040</b>	<b>0.05</b>
	€ 175,000	0.10588	0.12
	€ 225,000	-0.52628	-
Type	<b>Detached House</b>	<b>0.91075</b>	<b>0.00</b>
	Semi-detached House	-0.09597	0.18
	Terraced / Corner House	-0.81478	-
Size	Small (75 m <sup>2</sup> )	-0.86800	0.00
	Medium (125 m <sup>2</sup> )	0.30653	0.00
	<b>Large (175 m<sup>2</sup>)</b>	<b>0.56147</b>	-
Building year	Before 1945	-0.38058	0.00
	1945 - 1990	0.02183	0.77
	<b>After 1990</b>	<b>0.35875</b>	-
Single floor	Yes	0.10048	0.17
	No	-0.34500	0.00
	<b>No, but easy to adjust</b>	<b>0.24452</b>	-

Table 11: MNL Location choice

Multinomial Logit			
Variable		$\beta$	p
Constant		0.45143	0.00
Urbanism	In a Village	-0.00905	0.89
	At Village border	-0.14972	0.02
	<b>In rural area</b>	<b>0.15877</b>	-
Distance to Shops	1 km	0.26294	0.00
	<b>5 km</b>	<b>0.35630</b>	<b>0.58</b>
	10 km	-0.61924	-
Distance to Medical facilities	<b>1 km</b>	<b>0.12160</b>	<b>0.06</b>
	5 km	-0.02626	0.69
	10 km	-0.09534	-
Distance to primary schools	<b>1 km</b>	<b>0.09489</b>	<b>0.13</b>
	5 km	0.08406	0.20
	10 km	-0.17895	-
Distance to friends / family	1 km	0.01264	0.85
	<b>5 km</b>	<b>0.06402</b>	<b>0.33</b>
	10 km	-0.07666	-

Many attributes included into the model gave significant preferences. Unfortunately not all attributes did. The 'distance to medical facilities' was only 10% significant for the first level (1km), and 'distance to primary schools' and 'distance to friends/ family' where not significant at al. These two attributes do not contribute to the preferences to a statistical significant extent. The preferences for each attribute level can be seen in figure 29 A – J.



Figure 29: Attribute level preferences

Cheaper, detached properties, built after 1990 with more space are preferred as expected. The property does not need to be on a single floor. The location that is mostly preferred is in a rural area, close to medical facilities. But there is a slight preference to live at 5 km distance to a supermarket instead of 1 km. This indicates that, on average, people in East-Groningen rather not have a supermarket close to their home. This might be because they are used to do groceries by car.

Relative large negative utilities were estimated for the highest price (€ 225,000), terraced / corner houses, small properties, properties built before 1945 and a large distance to shops (10 km). These negative utilities shows an aversion against these attribute levels. The small size of 75m<sup>2</sup> was rated most negatively but is closely followed by the terraced / corner houses. This corresponds to the relative small number of small properties and the number of present terraced / corner houses in the area.

The impact of the attributes on the choices of households in East-Groningen can be indicated by the range between the highest and the lowest utility of the attribute. In figures 30 and 31 the importance of the attributes in respectively the housing attributes and the location attributes is shown in percentages.

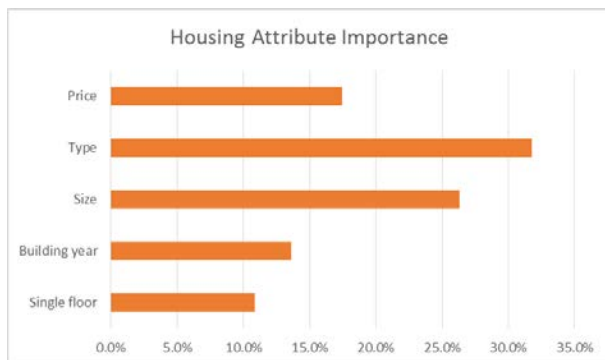


Figure 30: Housing attribute importance

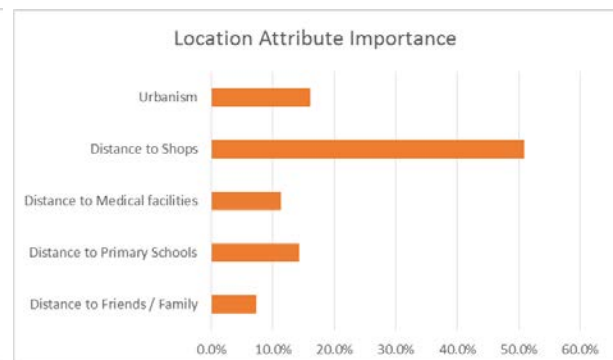


Figure 31: Location attribute importance

The impact of the housing type (31%) and the housing size (26%) are most important followed by the price (17%) of the property. This could be expected from the literature research. The housing attribute that was least important was whether the house is on a single floor. This was expected because only a few detached properties with a decent size are located on a single floor. The attribute with the most impact on the location is by far the distance to the shops with over 50%, thereafter the level of urbanism (16%) and the distance to primary schools (14%).

#### 5.5.1.1 Scenarios

With the estimated utilities per attribute level the total utility of a particular house can be calculated by summing the part-worth utilities of the housing characteristics. The overall utilities of the houses and locations can be compared to estimate how much the house or location will be preferred and chosen over another house or location. In table 12 the characteristics of three houses in East-Groningen are presented. All three houses are available, for sale and have different characteristics.

The Iepenlaan 32 in Alteveer is a terraced house of € 115,000.- The property is medium sized, and the building year is between 1945 – 1990. The property is not located on a single floor and it is not possible to adjust this. The location of this property is in a small town (945 inhabitants (CBS, 2012c)) in the municipality of Stadskanaal. The distance to a primary school is 1 km, to the nearest supermarket 4.2 km and to a general practitioner is 4.3 km.

Table 12: Scenarios (Funda, 2015)

Scenario	1	2	3
Property	Iepenlaan 32, Alteveer	Landbouwstraat 268, Wildervank	Veenweg 23, Beerta
			
Price	€ 115,000	€ 229,000	€ 97,500
Type	Terraced House	Semi-detached House	Detached House
Size	130 m2	170 m2	70 m2
Building year	1976	1993	1940
Single floor	No	No	Yes
Level of Urbanism	In a Village	At Village border	In Village
Distance to Shop	4.2 km	3.7 km	400 m
Distance to Medical Facility	4.3 km	5.3 km	2.0 km
Distance to Primary School	1.0 km	1.0 km	550 m

Landbouwstraat 268 in Wildervank is a semi-detached property of € 229,000.- The size is large, and it is relatively new built. The property is not on a single floor. The location is at the border of the village of Wildervank which is closely connected to Veendam in the municipality of Veendam. The distance to schools, shops and general practitioner are between 1 and 5.3 km.

The third property is a detached house in Beerta, a small town in the municipality of Oldambt. The property is rather small and old. The house has only 1 floor and is available for a price of € 97,500.-. The location is max 2.0 km away of schools, shops and medical facilities.

The overall housing utilities for the three houses is respectively -0.49, 0.07 and 0.10. This indicates that there is a slight preference for the property in Beerta and the property in Alteveer has a large negative utility and is least preferred compared to the other two scenarios. The probability that the property in Beerta was chosen over the properties in Alteveer, Wildervank and a no-preference option was calculated with the MNL model of formula 3:

$$P_{Beerta} = \frac{e^{0.10}}{e^{-0.49} + e^{0.07} + e^{0.10} + e^0} = 0.293$$

The probability that a household chooses the Beerta alternative over the other two alternatives and the no-preference option was 29.3%. The probability that the property in Alteveer was chosen is 16.2% and the property in Wildervank is 28.2%. The Veenweg in Beerta has two characteristics that are preferred, the price and the housing type. Two other, the size and the building year are influencing the overall utility in a negative way. The positive influence of the price and the housing type are much more stronger and therefore this property is preferred over the two other.

The overall location utilities (distance to friends/family excepted) for these three location is respectively 0.87, 0.73 and 0.92. All three properties are in or at the border of a village. The distance to a primary school is close with 1 km as maximum for all three properties. A general practitioner is furthest away for all three locations with a min of 2 km and max of 5.3 km. The probability the third location was chosen over the first two and a no-preference option is 31.6%.

### 5.5.2 Latent Class model

A Latent Class model was estimated for the housing and location data with NLogit 5.0. The LC model is used to classify respondents regarding their housing and location choices. This approach simultaneously groups the respondents and estimates a set of utility parameters for each of the classes. In the current study only two classes are distinguished because the data of all 88 respondents does not allow for significant results when more classes are applied.

Table 13: LC Housing choice

Latent Class		Class 1		Class 2	
Variable		$\beta$	p	$\beta$	p
Class probability		<b>0.61134</b>	<b>0.00</b>	0.38866	0.00
Constant		<b>1.75170</b>	<b>0.00</b>	-1.64155	0.00
Price	€ 125,000	0.14087	0.12	<b>0.25229</b>	<b>0.09</b>
	€ 175,000	<b>0.20626</b>	<b>0.02</b>	-0.12530	0.40
	€ 225,000	<b>-0.34713</b>	-	-0.12699	-
Type	Detached House	<b>0.69894</b>	<b>0.00</b>	1.59119	0.00
	Semi-detached House	0.01460	0.87	<b>-0.31122</b>	<b>0.09</b>
	Terraced / Corner House	-0.71354	-	<b>-1.27997</b>	-
Size	Small (75 m2)	<b>-0.98758</b>	<b>0.00</b>	-0.71114	0.00
	Medium (125 m2)	<b>0.39251</b>	<b>0.00</b>	0.16971	0.26
	Large (175 m2)	<b>0.59507</b>	-	0.54143	-
Building year	Before 1945	<b>-0.41822</b>	<b>0.00</b>	-0.25217	0.10
	1945 - 1990	0.04451	0.64	<b>-0.11271</b>	<b>0.47</b>
	After 1990	<b>0.37371</b>	-	0.36488	-
Single floor	Yes	<b>0.15282</b>	<b>0.11</b>	0.05713	0.71
	No	<b>-0.38400</b>	<b>0.00</b>	-0.33060	0.04
	No, but easy to adjust	0.23118	-	<b>0.27347</b>	-

Table 14: LC Location choice

Latent Class		Class 1		Class 2	
Variable		$\beta$	p	$\beta$	p
Class probability		<b>0.67951</b>	<b>0.00</b>	0.32049	0.00
Constant		<b>3.30503</b>	<b>0.00</b>	-1.23448	0.00
Urbanism	In a Village	<b>0.00970</b>	<b>0.90</b>	-0.00960	0.95
	At Village border	<b>-0.18785</b>	<b>0.10</b>	-0.10068	0.48
	In rural area	<b>0.17815</b>	-	0.11028	-
Distance to Shops	1 km	0.20356	0.01	<b>0.51189</b>	<b>0.00</b>
	5 km	0.13400	0.07	<b>-0.33044</b>	<b>0.05</b>
	10 km	<b>-0.33756</b>	-	-0.18145	-
Distance to Medical facilities	1 km	<b>0.17657</b>	<b>0.02</b>	0.00316	0.98
	5 km	<b>-0.05251</b>	<b>0.51</b>	0.04653	0.76
	10 km	<b>-0.12406</b>	-	-0.04969	-
Distance to primary schools	1 km	<b>0.03374</b>	<b>0.64</b>	0.31617	0.02
	5 km	0.17130	0.02	<b>-0.19716</b>	<b>0.20</b>
	10 km	<b>-0.20504</b>	-	-0.11901	-
Distance to friends / family	1 km	0.03098	0.70	<b>-0.09811</b>	<b>0.54</b>
	5 km	0.10300	0.18	<b>-0.01921</b>	<b>0.90</b>
	10 km	<b>-0.13398</b>	-	0.11732	-

In table 13 and 14 the results of the LC models are shown. 61.1% of the responses are described by class 1 of the housing attributes and 67.9% of the responses are described by class 1 of the location attributes.

Again is the  $\rho^2$  of McFadden used to measure the goodness of fit of the model that was used. The  $\rho^2$  is 0.25 for the housing preferences and 0.14 for the location preferences. The housing preferences is indicated an excellent fit and the location preferences are considered a sufficient fit. The values of the LC model are higher than the MNL model and there is an excellent fit for the housing model and a sufficient fit for the location model, instead of a sufficient and a weak model of fit for the MNL models. Therefore the LC model has a better fit than the MNL model.

### Housing

A detached property was important for both classes but it was far more important for people in the second class (utility 1.59) than the first class (utility 0.69). Therefore the second housing class could be characterized as freedom seekers. This class prefers a large property for a low price, built after 1990 and the floor needs to be adjustable to a single floored property. The first housing class also shows a preference for a detached, large and newly built property. However the price is preferred to be € 175,000.-. Overall shows this class less extreme values for the attributes, therefore this class is characterized as moderates.

### Location

The distance to shops was most important for both classes but it was far more important for the second (utility 0.51) than the first (utility 0.20) class. The second class is therefore referred to as shoppers. The shoppers prefer a close distance to shops and primary schools. The distance to medical facilities is preferred at 5 km and friends / family are less important with a slight preference for 10 km distance. The first class shows once more less extreme values for the attributes and is characterized as moderates. The moderates show a preference for a close distance to medical facilities (1 km) and the distance to primary schools and friends / family is preferable 5 km. The level of urbanism is preferred by both the shoppers and the moderates as in a rural area.

In general the Latent Class model estimated for the location shows less extreme values than the housing preferences. Indicating that the house choice is more important than the location of the property. In figure 32 and 33 difference in attribute importance between the classes is shown. In appendix VIII the relative preferences per attribute level are shown.

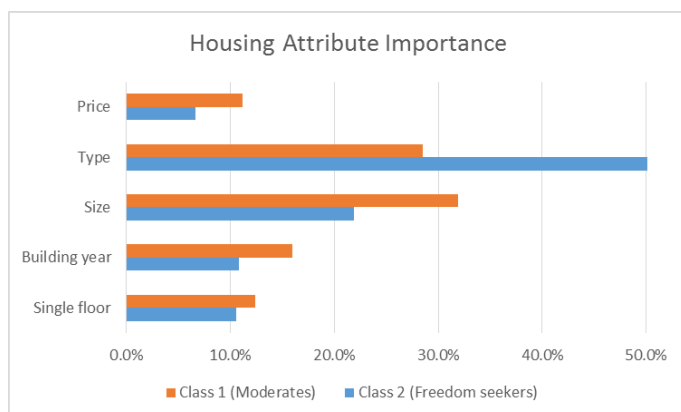


Figure 32: LC Housing attribute importance

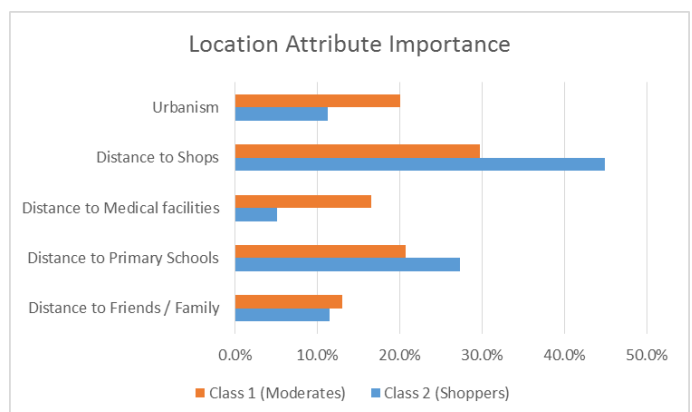


Figure 33: Location attribute importance

### 5.5.2.1 Pearson's Chi-square test

Combining the individual LC probabilities and the questionnaire output from SPSS, individual characteristics for both classes were compared. A Pearson Chi-square test was estimated with 21 housing, household and location factors. The test was done with both the housing and location preferences of the LC model. The Chi-Square test compares the observed count of the observations with the expected count in each category. If the expected number of observations is too small the chi-square test may give inaccurate results. The expected number of observations is too small when this is less than 5 (McDonald, 2014). Because the number of respondents is relatively small (88) many of the estimated factors give inaccurate results.

Of the fifteen factors with accurate information the asymptotic significance (p-value) is analyzed. 3 factors have a significant relationship with 90% confidence. These factors are for the housing choice: the current property being a rented or an owner-occupied property with a p-value of 0.085, and the housing type with p-value of 0.009. For the location choice only one factor has a significant relationship, this is the gender of the respondent with a p-value of 0.002. Therefore the housing choices is dependent on the ownership and the type of the current house. The location choice is dependent on the respondent being either a male or female. All other factors are considered independent.

Figure 34 shows there is a stronger relationship between the current housing being owner-occupied or rent and the moderates than with the second class. The moderates have an average housing type with all housing types relatively evenly distributed (see figure 35), with an exception for the detached property. The Freedom seekers have in the mainstream an owner-occupied property.

For location choice there is a relationship between the gender and the different classes. The male respondents are evenly distributed between the classes, as can be seen in figure 36. The women have a stronger connection to the first class, with 38 out of 46 women present in this class. Therefore the women have a stronger preference for a supermarket at close distance, but more important a medical facility is preferred by this group at 1 km distance.

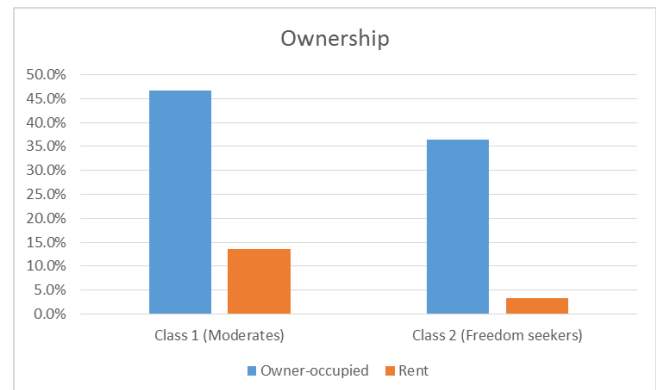


Figure 34: Significant relationship Housing choice - Ownership

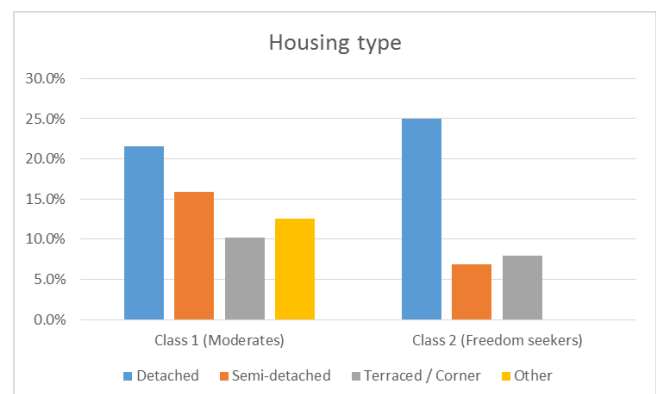


Figure 35: Significant relationship Housing choice - Current Housing type

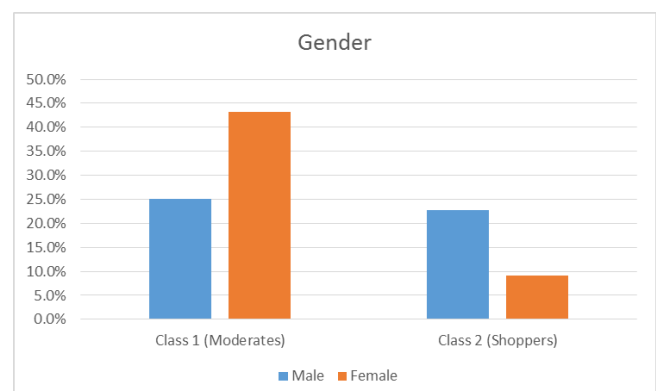


Figure 36: Significant relationship Location choice - Gender

### 5.5.2.2 Scenarios

With the estimated utilities per attribute level the total utility of a particular house can be calculated for both classes. The overall utilities of the houses and locations can be compared to estimate how much the house or location will be preferred, by which class and chosen over another house or location. The three scenarios as presented with the MNL model are discussed again in table 15.

Table 15: LC Scenarios (Funda, 2015)

Scenario	1			2			3		
Property	Iepenlaan 32, Alteveer			Landbouwstraat 268, Wildervank			Veenweg 23, Beerta		
									
	Level	Class 1	Class 2	Level	Class 1	Class 2	Level	Class 1	Class 2
Constant	-	1.75170	0.38866	-	1.75170	0.38866	-	1.75170	0.38866
Price	0	0.14087	0.25229	2	-0.34713	-0.12699	0	0.14087	0.25229
Type	2	-0.71354	-1.27997	1	0.01460	-0.31122	0	0.69894	1.59119
Size	1	0.39251	0.16971	2	0.59507	0.54143	0	-0.98758	-0.71114
Building year	1	0.04451	-0.11271	2	0.37371	0.36488	0	-0.41822	-0.25217
Single floor	1	-0.38400	-0.33060	1	-0.38400	-0.33060	0	0.15282	0.05713
Total	-	1.23205	-0.91262	-	2.00395	0.52616	-	1.33853	1.32596
Constant	-	3.30503	-1.23448	-	3.30503	-1.23448	-	3.30503	-1.23448
Level of Urbanism	0	0.00970	-0.00960	1	-0.18785	-0.10068	0	0.00970	-0.00960
Distance to Shop	1	0.13400	-0.33044	1	0.13400	-0.33044	0	0.20356	0.51189
Distance to Medical Facility	1	-0.05251	0.04653	1	-0.05251	0.04653	0	0.17657	0.00316
Distance to Primary School	0	0.03374	0.31617	0	0.03374	0.31617	0	0.03374	0.31617
Total	-	3.42996	-1.21182	-	3.23241	-1.30290	-	3.72860	-0.41286

It can be seen that the overall utilities of the housing and the location scenarios were quite different for both classes this is because of varying part-worth utilities. The largest overall housing utility is for the Landbouwstraat with an utility of 2.00 for the moderates in the first class. The lowest utility is for the Iepenlaan with -0.91 for the freedom seekers. The utilities of both classes for the Veenweg are close, with 1.34 for the first and 1.33 for the second class indicating that both classes have the same overall utility for this property.

The probability that the Landbouwstraat in Wildervank is chosen over the other two properties and a no-preference option is 47.3% for the first class and 24.6% for the second class. For the Iepenlaan in Alteveer this is respectively 21.9% and 5.9%. The probability that the Veenweg in Beerta is chosen over the others and the no-preference is 24.4% for the first and 55.1% for the second class. This shows a difference in preferences for both the classes. Nevertheless the overall utility of both classes being almost the same the third scenario is more likely to be chosen by the freedom seekers with a probability of 55.1%.

The overall location utilities for the three locations differ between the two classes. The moderates have strong preferences for all three properties, with utilities of 3.43, 3.23 and 3.73. The shoppers have negative utilities (respectively -1.21, -1.30 and -0.41) for all three locations and this indicates that these locations are not preferred by this class. The probability the location at the Iepenlaan is preferred over the other two and a no-preference option is 31.2% for the first and 13.3% for the second class, for the Landbouwstraat this is respectively 25.6% and 12.2% and for the Veenweg this is 42.2% and 29.7%.



### 5.5.3 Comparison with current housing stock

The results of the stated choice experiment are compared with the current housing stock which is described in the third chapter. In this paragraph only the results of the Latent Class model is compared to the current housing stock because of the better goodness of fit than the Multinomial Logit model.

#### Housing

The five housing attributes that are researched are price, housing type, size (m<sup>2</sup>), Building year and whether it is on a single floor. The most important attribute was housing type, both classes had a strong preference for a detached property. 45.9% of the current stock is detached, the utility for this attribute level is high, and the utility for a terraced / corner house is negative for both classes and is therefore not preferred.

The size was most important for the moderates in the first class, but both classes prefer as expected a large property. However only 17.4% of the current properties is larger than 175m<sup>2</sup>. This indicates that size of the current housing stock does not meet the preferences. The price was preferred to be € 175,000 or less for both classes and the current housing stock offers 57.7% of the 42.000 properties below this price. 19.1% of the current housing stock was built after 1990, this does not meet the preferences of the owner-occupier in East-Groningen which has a strong preference for a newly built property.

There is no strong preference for a single floored property. The respondents do prefer to live in a property that can be adjusted to a single floored property, this indicates that people would like to live in a house that can be adjusted when climbing stairs becomes more difficult. For example when the occupants get older.

These results indicate that the current housing stock needs to be adjusted to meet the needs of the owner-occupied sector in East-Groningen, expensive terraced / corner houses with a small size and with a building year before 1945 are not preferred any more. The combination of part-worth negative utilities can be seen by both classes. The moderates shows a stronger aversion to the high price, small size and the building year, and the freedom seekers indicates the housing type as the most negative part-worth utility.

#### Location

The results in this research show that the strongest location preference is the distance to the supermarket. This distance was most important for both classes, the moderates found it 30% important and the shoppers stated it 45% important, both classes preferred the smallest distance (1 km). This connects with the current situation with an average 1.3 km to a supermarket. In the municipality of Menterwolde the supermarket is closest with 800 m, and in Vlagtwedde it is furthest at 1.8 km average.

The location preference in case of the level of urbanism is for both classes in a rural area. The municipalities of Bellingwedde, Vlagtwedde and Menterwolde are not urbanized (less than 500 addresses per km<sup>2</sup>) The other 4 municipalities are considered to have a low level of urbanization (500-1000 addresses per km<sup>2</sup>). However this is an average in the municipality and there are several larger towns in East-Groningen where the level of urbanism is higher. But East-Groningen is considered a rural area.

The distance to medical facilities was far more important to the moderates. The moderates in the first class preferred a distance of 1 km, and the second class preferred 5 km. The current situation is very different at municipality level. In Oldambt the medical facility is closest with 4.5km and in Vlagtwedde it is furthest with 16.7km. At average the medical facility is at 8.2km distance. The results indicate

therefore that the people in East-Groningen prefer to move to a location that is closer to a medical facility.

The distance to primary schools is not important to all inhabitants in East-Groningen. The moderates prefer it at 5 km distance and the shoppers prefers it to be closer. In general the distance to a primary school is 900 m in East-Groningen. Because the current availability of a primary school in the neighborhood is good it is relatively easy to find a property with a primary school at the preferred distance. The distance to friends and family has a low utility with a slight preference for 5 and 10 km. Because the utility is low it is not important whether the family and friends live in the same town or further away.

The results for the preferred locations correspond to the possibilities that are offered by the current owner-occupied housing market in East-Groningen.

## 5.6 CONCLUSION

In this chapter the results are reviewed of the stated choice experiment on housing and location preferences of the owner-occupied sector in East-Groningen. The individual characteristics were described, and the current housing situation of the respondents was explained. The housing and location choices are described by two different models: the MNL and the LC model. In the MNL the expected housing preferences (cheaper, detached, new and with more space) are estimated. The location was preferred to be in a rural area and the distance to medical facilities was relatively important for the respondents. The  $\rho^2$  of McFadden is used to measure the goodness of fit.  $\rho^2$  is 0.17 for the housing preferences and 0.03 for the location preferences. This indicates not an excellent fit, but a sufficient fit for the housing and the location model is considered weak.

Three scenarios were tested with the MNL model, The highest probability (29.3%) was for the property at the Veenweg 23 in Beerta being chosen over the other two properties and a no-preference option. The probability that the location in Beerta was chosen over the other alternatives and the no-preferences option is 31.6%.

In the Latent Class model two different classes are distinguished. Again is the  $\rho^2$  of McFadden used to measure the goodness of fit of the model that was used. The  $\rho^2$  is 0.25 for the housing preferences and 0.14 for the location preferences. The housing preferences is indicated an excellent fit and the location preferences are considered a sufficient fit. The higher values for the  $\rho^2$  in the LC model indicate a better fit than the MNL model.

For the housing preferences the distinguished classes are the moderates and the freedom seekers, for the location preferences moderates and shoppers are distinguished. The moderates are the largest group in both models with 61.1% and 67.9% of the respondents. The freedom seekers have the strongest preference for the part-worth utility of the detached property, followed by a large size and a low price and the shoppers prefer to live close (1 km) to a supermarket and have a preference to live close to a primary school. Both groups of moderates show less extreme values for the attributes in the models.

The Pearson's Chi-square test show 3 significant relationships with 90% confidence. The relationships are between housing choice and current ownership, housing choice and current housing type and location choice and gender of the respondent. The probability of the property in Wildervank being chosen by the first class is 47.3% and the probability of the Veenweg in Beerta being chosen over the other two and the no-preference option was 55.1% for the shoppers. The highest probability that the location is being chosen by the moderates is for the Veenweg in Beerta. The shoppers have negative utilities for all three options and therefore these locations are not preferred by this class.

According to the comparison of the LC model and the current housing stock, the current housing stock needs to be adjusted to meet the needs of the owner-occupied sector in East-Groningen in case of the housing attributes. Expensive terraced / corner houses with a small size and built before 1945 are not preferred anymore. The first class show a stronger aversion to the high price, small size and the building year and the second class indicate the housing type as most negative part-worth utility. In contrast to the housing preferences to the location possibilities correspond to the preferred locations.



## 6 CONCLUSION & DISCUSSION

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Shrinking areas occur all over the world and cannot be compared to each other. The shrinking area of East-Groningen is characterized by the large number of owner-occupied properties in the area. The current research was conducted to get to know the housing and housing location preferences of people who want to live in an owner-occupied property in East-Groningen.

This chapter is divided into the conclusion with the answers to the (sub) research questions which were stated in the introduction of this research and in the following paragraph the discussion and the recommendations for further research can be found.

### 6.1 CONCLUSION

This study investigated the owner-occupied housing sector in East-Groningen. The first two sub questions are answered through literature research concerning the demographic factors influencing the households and the housing and location attributes that are most influencing in the housing and location choice. The final sub question is answered by conducting a stated choice experiment which included a questionnaire which was distributed in East-Groningen. Finally the main research question will be answered.

1. What are the current and future demographic factors that influence households?

The first intent of this research was to explain the current and future demographic factors that influence the households in East-Groningen. All demographic trends influence the housing market, growth and shrinkage of the population is of all times and this occurs all over the world. The shrinkage leads to a decrease of the general population, labor force and number of households. The latter influences the housing market in the area. The change in household composition (there will be an increase in single households) and the decrease in the number of households changes the housing demand. According to prognoses of ABF research (2014) there will be more houses (65,400) than households (59,200) in East-Groningen around 2040. This will lead to major vacancy when there is no intervention in the owner-occupied sector of the housing market.

2. What are the most influencing attributes for the housing choices of owner-occupied households in the shrinking area?

Owner-occupiers in East-Groningen were asked about their housing and housing location preferences in a stated choice experiment. Hypothetical alternatives are described by two sets of 5 attributes in this experiment. The attributes that were used are derived from a literature study and input from experts from the area. A selection of attributes needed to be made because only the most important attributes are taken into account. The first set of attributes are about housing itself, the attributes used are price, housing type, size, building year and whether it is located on a single floor. The second set of attributes are about the housing location and the location attributes are, level of urbanism, distance to shops, distance to basic medical facilities, distance to primary schools, and the distance to friends and or family.

Besides the housing and location preferences the respondents were asked about their age, gender level of education and jobs, also household characteristics and their current housing situation were included in the questionnaire.

3. Does the owner-occupied sector still meet the needs of the customer in the area of Groningen?

To answer the third sub question the data that was gathered using an online survey tool was used to estimate the complex housing choice decisions. Two different models are used to analyze the collected data, the Multinomial Logit and the Latent Class model are used. Both models were estimated for the housing and the location preferences separately. The  $\rho^2$  of McFadden was used to measure the goodness of fit of the models. For the MNL model the goodness of fit was sufficient (0.17) for the housing preferences and weak (0.03) for the location preferences. For the LC model the goodness of fit was better with respectively an excellent fit of 0.25 and a sufficient fit of 0.14.

The strongest housing preference is for cheaper, detached properties, which are relatively new built and have a large size. The single floor is not preferred. In the LC model is a detached property far more important for people in the second class compared to the first. The first class has less extreme values for the attributes and is considered moderate.

In the MNL model for the location is the distance to shops by far the most important location part-worth utility. In the LC model this is still important but more important for the second (therefore called shoppers) than the first (moderates) class. Overall shows the location estimates less extreme values compared to the housing estimates, indicating the housing choice to be more important.

The estimations of the MNL and the LC model are compared to the current housing stock as described by the WOON research of BZK / CBS (2012). The results of this comparison indicate that the current housing stock needs to be adjusted to meet the needs of the owner-occupied sector in East-Groningen, expensive terraced / corner houses with a small size and with a building year before 1945 are not preferred any more. The combination of these part-worth negative utilities can be seen by the MNL model and both classes of the LC model. The first class shows a stronger aversion to the high price, small size and the building year, and the second class indicates the housing type as the most negative part-worth utility. The results for the preferred locations do correspond to the possibilities that are offered by the current owner-occupied housing market in East-Groningen. Therefore do the location preferences meet the needs of the customer in East-Groningen.

### **Main research question**

The three formulated sub questions lead to the answer of the main question. The sub questions are about the demographic factors influencing the households, the attributes of factors that are most important for the owner-occupied households in East-Groningen and whether the current owner-occupied sector still meets the needs of the customer. The main research question was:

*How to adjust the owner-occupied housing sector towards today's demographic trends in the shrinking area of the province of Groningen and in which parts of the owner-occupied sector is intervention needed?*

The owner-occupied housing sector needs to be adjusted to keep up with the demographic trends in East-Groningen. The number of households is expected to decline with 11.6% to 59,200 households in 2040 and the number of houses is expected to decline with 4% to 65,400 in the same year. Therefore intervention is needed in several parts of the owner-occupied sector in East-Groningen. The expensive terraced / corner houses with a small size and a building year before 1945 are not preferred anymore. When possible these properties need to be removed from the housing market. By doing so there will be less properties vacant and this will influence the market in a positive manner. The location of the properties where intervention is needed is not important. The current housing locations do

meet the needs of the owner-occupier in East-Groningen. The intervention in the housing sector is needed to keep the decline of the housing stock in line with the decline in households to avoid massive vacancy in this sector in the future.

## 6.2 DISCUSSION

The shrinking number of households and the change in household composition in East-Groningen are influencing the owner-occupied housing sector in the area. Without intervention there will be more owner-occupied properties than households in 2040 in East-Groningen. This was not expected to be this extreme and intervention is needed. To know where intervention is needed the housing and location preference of respondents in East-Groningen is researched.

The current and future demographic factors that influence the population in East-Groningen. Have a great influence on the housing market in the area. The most important attributes for housing choice, price, housing type, size building year and whether the house is located on a single floor are researched and for the location choice, level of urbanism and distance to shops, medical facilities, primary schools and friends/family are researched and used in a stated choice experiment, the data that was obtained by a questionnaire was analyzed by using a Multinomial Logit and a Latent Class model. This is carried out in two simulations researches due to practical issues it was not desired to combine the housing and the location choices. This did lead to two different researches instead of one, therefore the results of the housing and the location preferences cannot be combined to one concrete result.

### **What needs to be done in the owner-occupied housing market in East-Groningen?**

The owner-occupied housing sector in East-Groningen needs to adjust to the shrinking population. The houses that are preferred by the people in East-Groningen should be kept, but the properties with large negative utilities such as expensive, small terraced / corner houses need to be withdrawn. The current data of the housing stock does not provide actual combinations of the different attributes and this data is needed to select and list the number of houses that need to be withdrawn from the market.

The properties that are not preferred need to be adjusted. Three different strategies can be applied to the houses that need to be withdrawn from the market:

1. Demolition of the property
2. Adjust to preferred property
3. Change the primary function of the property

All three strategies are expected to be costly, demolition can be even considered as loss of capital and money for the adjustment of the owner-occupied housing market needs to be found.

Therefore the municipalities need to help the owner-occupiers with their least preferred properties, because in the owner-occupied sector many stakeholders are active it is important to find a way to reach and to convince them. Strategies need to be determined by the local government to help this part of the housing sector and the local housing policy should be adapted to the current and future situation, in addition, house owners must become aware of the issues and they should be encouraged to take action. This action could be reinforced for example through subsidies or other compensation issues. This research could be used to determine where the help is needed in the market.

### 6.2.1 Reliability of this research

The reliability of this research is an important factor. In order to reduce unreliability a stated choice method was used and the stated choice research is based on a literature study and the research is carried out digitally to reduce accidental error in answering the questions in the questionnaire. However there is always the possibility that inadvertently a wrong answer was given, or respondent gives a socially desirable response rather than his own preference, or a small mistake was made by the researcher in calculating the results.

The research is carried out independently, no company or governmental institution was involved in this study. The researcher has no economical or emotional connection to East-Groningen and has kept distance from the subject.

The sample of the population was small with only 88 respondents. This resulted in a reduced external validity of the results because of the differences between the sample and the population in East-Groningen. A slightly reduced external validity of the results also occurred between the current housing and location characteristics of the respondents and the housing and location characteristics in the population of East-Groningen.

### 6.2.2 Limitations and further research

Shrinkage differentiates per location. The shrinking areas are different and they should not be compared, this limits the present research to the East-Groningen area only. This study is unable to encompass the entire housing market in East-Groningen therefore only the owner-occupied sector is taken into account. It would be interesting to research the entire housing market including the rented properties, however the approach to the solution could be very different due to different stakeholders.

There was also a limited number of location and housing attributes taken into account within the stated choice experiment. Ten attributes were used, while more attributes might influence the housing and location choice behavior as well. The accessibility by public transport and the housing condition are mentioned by the respondents as important issues in housing choice.

It is beyond the scope of this study to examine the number of owner-occupied properties that need to be withdrawn from the market. The current housing data that was used is not sufficient to draw exact conclusions. The number of properties that needs to be withdrawn and in which time scope this needs to be done is very important. Besides this it is important that a strategy is formed by the local government to activate house owners to withdraw owner-occupied properties from the market, it is likely that subsidies are needed to compensate property owners for their financial loss when the houses are withdrawn. Besides this the reader should bear in mind that the study is based on a questionnaire with only 88 respondents, which was not entirely valid. It would be interesting to study a larger group of respondents with a higher level of validation.



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## APPENDIXES

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Appendix I: Age Head of Household in Netherlands and East-Groningen

Appendix II: Market data of the NVM (Dutch Real Estate Agency)

Appendix III: Housing and Location Profiles (Dutch)

Appendix IV: Choice sets

Appendix V: Questionnaire

Appendix VI: Current housing situation respondents

Appendix VII: Current housing location respondents

Appendix VIII: LC Attribute level preferences

## APPENDIX I

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Age of the Head of the household in the Netherlands and East-Groningen.  
The head of the household is:

- Within a couple: the (oldest) male;
- Single parent family: the parent;
- Other household: the oldest male of age or when not present the oldest women of age.

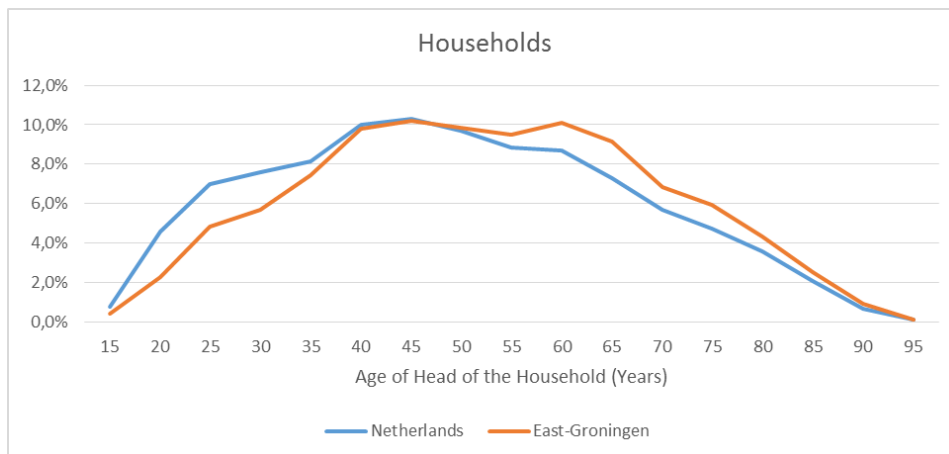


Figure 1: Household age distribution (CBS, 2012)

## APPENDIX II

Market data NVM, about the seven municipalities in East-Groningen. Four tables about housing characteristics of houses for sale:

- Housing types
- Level of Urbanism
- Number of rooms
- Square meters

### Aanbod naar woningtype

Peildatum	Woningtype	Aantal	Mediane vraagprijs	Mediane looptijd van het aanbod
1-7-2012	Tussenwoning	174	€ 114.500	318
	Hoekwoning	152	€ 135.000	385
	2-onder-1-kap	374	€ 159.500	389
	Vrijstaand	999	€ 229.000	430
	Appartement	178	€ 116.750	328
	<b>Totaal</b>	<b>1877</b>	<b>€ 174.500</b>	<b>396</b>
1-7-2013	Tussenwoning	169	€ 114.500	489
	Hoekwoning	140	€ 129.000	493
	2-onder-1-kap	382	€ 159.250	494
	Vrijstaand	1039	€ 225.000	538
	Appartement	176	€ 114.950	571
	<b>Totaal</b>	<b>1906</b>	<b>€ 174.500</b>	<b>522</b>
1-7-2014	Tussenwoning	203	€ 112.500	383
	Hoekwoning	158	€ 127.500	440
	2-onder-1-kap	383	€ 156.500	583
	Vrijstaand	1123	€ 224.500	599
	Appartement	192	€ 111.000	630
	<b>Totaal</b>	<b>2059</b>	<b>€ 169.500</b>	<b>574</b>
1-7-2015	Tussenwoning	245	€ 114.500	363
	Hoekwoning	160	€ 129.500	424
	2-onder-1-kap	424	€ 153.500	410
	Vrijstaand	1207	€ 225.000	539
	Appartement	194	€ 109.500	482
	<b>Totaal</b>	<b>2230</b>	<b>€ 169.500</b>	<b>490</b>

Bron: NVM

\*cijfers 2015 voorlopig

## Aanbod naar stedelijkheid

Peildatum	Urbanisatiegraad	Aantal	Mediane vraagprijs	Mediane looptijd van het aanbod
1-7-2012	Sterk stedelijk	139	€ 139.500	314
	Matig stedelijk	405	€ 149.500	370
	Weinig stedelijk	557	€ 172.500	435
	Niet stedelijk	776	€ 199.000	368
	<b>Totaal</b>	<b>1877</b>	<b>€ 174.500</b>	<b>396</b>
1-7-2013	Sterk stedelijk	140	€ 143.500	533
	Matig stedelijk	418	€ 149.500	493
	Weinig stedelijk	546	€ 174.500	585
	Niet stedelijk	802	€ 197.000	509
	<b>Totaal</b>	<b>1906</b>	<b>€ 174.500</b>	<b>522</b>
1-7-2014	Sterk stedelijk	150	€ 139.000	578
	Matig stedelijk	453	€ 145.000	536
	Weinig stedelijk	625	€ 169.500	564
	Niet stedelijk	831	€ 197.500	593
	<b>Totaal</b>	<b>2059</b>	<b>€ 169.500</b>	<b>574</b>
1-7-2015	Sterk stedelijk	145	€ 139.000	555
	Matig stedelijk	513	€ 144.500	489
	Weinig stedelijk	680	€ 163.500	490
	Niet stedelijk	892	€ 198.000	487
	<b>Totaal</b>	<b>2230</b>	<b>€ 169.500</b>	<b>490</b>

Bron: NVM

\*cijfers 2015 voorlopig



## Aanbod naar aantal kamers

Peildatum	Aantal kamers	Aantal	Mediane vraagprijs	Mediane looptijd van het aanbod
1-7-2012	1	4	€ 84.750	29
	2	27	€ 104.500	474
	3	218	€ 129.500	347
	4	539	€ 155.000	417
	5	607	€ 174.750	402
	6	286	€ 212.000	389
	7 of meer	196	€ 289.000	361
	<b>Totaal</b>	<b>1877</b>	<b>€ 174.500</b>	<b>396</b>
1-7-2013	1	2	€ 217.250	1651
	2	35	€ 99.500	556
	3	212	€ 129.500	533
	4	565	€ 155.000	493
	5	582	€ 174.500	527
	6	290	€ 225.000	561
	7 of meer	220	€ 269.250	471
	<b>Totaal</b>	<b>1906</b>	<b>€ 174.500</b>	<b>522</b>
1-7-2014	1	2	€ 217.250	2016
	2	35	€ 89.000	564
	3	233	€ 129.000	545
	4	624	€ 149.500	541
	5	654	€ 169.500	513
	6	280	€ 235.000	804
	7 of meer	231	€ 269.500	568
	<b>Totaal</b>	<b>2059</b>	<b>€ 169.500</b>	<b>574</b>
1-7-2015	1	2	€ 217.250	2381
	2	37	€ 99.500	442
	3	239	€ 127.500	456
	4	662	€ 149.500	491
	5	737	€ 169.500	448
	6	301	€ 239.000	583
	7 of meer	252	€ 269.000	549
	<b>Totaal</b>	<b>2230</b>	<b>€ 169.500</b>	<b>490</b>

Bron: NVM

\*cijfers 2015 voorlopig

## Aanbod naar woonoppervlak

Peildatum	Woonoppervlakte	Aantal	Mediane vraagprijs	Mediane looptijd van het aanbod
1-7-2012	minder dan 50 m2	8	€ 94.000	243
	50 tot 70 m2	54	€ 98.250	452
	70 tot 90 m2	204	€ 109.500	309
	90 tot 120 m2	645	€ 144.500	347
	120 tot 150 m2	501	€ 199.000	439
	150 tot 200 m2	323	€ 259.500	458
	vanaf 200 m2	142	€ 347.000	386
	<b>Totaal</b>	<b>1877</b>	<b>€ 174.500</b>	<b>396</b>
1-7-2013	minder dan 50 m2	10	€ 90.000	291
	50 tot 70 m2	51	€ 97.500	637
	70 tot 90 m2	207	€ 108.000	396
	90 tot 120 m2	662	€ 147.750	472
	120 tot 150 m2	479	€ 192.500	591
	150 tot 200 m2	342	€ 259.500	619
	vanaf 200 m2	155	€ 325.000	514
	<b>Totaal</b>	<b>1906</b>	<b>€ 174.500</b>	<b>522</b>
1-7-2014	minder dan 50 m2	11	€ 79.500	434
	50 tot 70 m2	59	€ 95.500	585
	70 tot 90 m2	238	€ 109.500	473
	90 tot 120 m2	732	€ 146.500	492
	120 tot 150 m2	521	€ 189.500	644
	150 tot 200 m2	331	€ 269.000	750
	vanaf 200 m2	167	€ 329.500	551
	<b>Totaal</b>	<b>2059</b>	<b>€ 169.500</b>	<b>574</b>
1-7-2015	minder dan 50 m2	7	€ 106.500	827
	50 tot 70 m2	67	€ 95.000	442
	70 tot 90 m2	261	€ 109.500	377
	90 tot 120 m2	784	€ 142.500	455
	120 tot 150 m2	531	€ 192.500	555
	150 tot 200 m2	378	€ 259.500	629
	vanaf 200 m2	202	€ 325.000	458
	<b>Totaal</b>	<b>2230</b>	<b>€ 169.500</b>	<b>490</b>

Bron: NVM

\*cijfers 2015 voorlopig

## APPENDIX III

There are 2 times 27 different profiles:

Nr	Prijs	Type	Grootte	Jaar	Gelijkvloers
1	€ 125.000	Vrijstaand	Klein (75 m2)	Voor 1945	Ja
2	€ 125.000	Vrijstaand	Gemiddeld (125 m2)	1945 - 1990	Nee (wel gelijkvloers te maken)
3	€ 125.000	Vrijstaand	Groot (175 m2)	Na 1990	Nee
4	€ 125.000	Twee-onder-een-kap	Klein (75 m2)	1945 - 1990	Nee (wel gelijkvloers te maken)
5	€ 125.000	Twee-onder-een-kap	Gemiddeld (125 m2)	Na 1990	Nee
6	€ 125.000	Twee-onder-een-kap	Groot (175 m2)	Voor 1945	Ja
7	€ 125.000	Rij-/Hoekwoning	Klein (75 m2)	Na 1990	Nee
8	€ 125.000	Rij-/Hoekwoning	Gemiddeld (125 m2)	Voor 1945	Ja
9	€ 125.000	Rij-/Hoekwoning	Groot (175 m2)	1945 - 1990	Nee (wel gelijkvloers te maken)
10	€ 175.000	Vrijstaand	Klein (75 m2)	1945 - 1990	Nee
11	€ 175.000	Vrijstaand	Gemiddeld (125 m2)	Na 1990	Ja
12	€ 175.000	Vrijstaand	Groot (175 m2)	Voor 1945	Nee (wel gelijkvloers te maken)
13	€ 175.000	Twee-onder-een-kap	Klein (75 m2)	Na 1990	Ja
14	€ 175.000	Twee-onder-een-kap	Gemiddeld (125 m2)	Voor 1945	Nee (wel gelijkvloers te maken)
15	€ 175.000	Twee-onder-een-kap	Groot (175 m2)	1945 - 1990	Nee
16	€ 175.000	Rij-/Hoekwoning	Klein (75 m2)	Voor 1945	Nee (wel gelijkvloers te maken)
17	€ 175.000	Rij-/Hoekwoning	Gemiddeld (125 m2)	1945 - 1990	Nee
18	€ 175.000	Rij-/Hoekwoning	Groot (175 m2)	Na 1990	Ja
19	€ 225.000	Vrijstaand	Klein (75 m2)	Na 1990	Nee (wel gelijkvloers te maken)
20	€ 225.000	Vrijstaand	Gemiddeld (125 m2)	Voor 1945	Nee
21	€ 225.000	Vrijstaand	Groot (175 m2)	1945 - 1990	Ja
22	€ 225.000	Twee-onder-een-kap	Klein (75 m2)	Voor 1945	Nee
23	€ 225.000	Twee-onder-een-kap	Gemiddeld (125 m2)	1945 - 1990	Ja
34	€ 225.000	Twee-onder-een-kap	Groot (175 m2)	Na 1990	Nee (wel gelijkvloers te maken)
25	€ 225.000	Rij-/Hoekwoning	Klein (75 m2)	1945 - 1990	Ja
26	€ 225.000	Rij-/Hoekwoning	Gemiddeld (125 m2)	Na 1990	Nee (wel gelijkvloers te maken)
27	€ 225.000	Rij-/Hoekwoning	Groot (175 m2)	Voor 1945	Nee
Nr	Stedelijkheid	Winkels	Medische Voorz.	Basisschool	Vrienden / Familie
1	In een dorpskern	1 km	1 km	1 km	1 km
2	In een dorpskern	1 km	5 km	5 km	10 km
3	In een dorpskern	1 km	10 km	10 km	5 km
4	In een dorpskern	5 km	1 km	5 km	10 km
5	In een dorpskern	5 km	5 km	10 km	5 km
6	In een dorpskern	5 km	10 km	1 km	1 km
7	In een dorpskern	10 km	1 km	10 km	5 km
8	In een dorpskern	10 km	5 km	1 km	1 km
9	In een dorpskern	10 km	10 km	5 km	10 km
10	Aan de rand van een dorp	1 km	1 km	5 km	5 km
11	Aan de rand van een dorp	1 km	5 km	10 km	1 km
12	Aan de rand van een dorp	1 km	10 km	1 km	10 km
13	Aan de rand van een dorp	5 km	1 km	10 km	1 km
14	Aan de rand van een dorp	5 km	5 km	1 km	10 km
15	Aan de rand van een dorp	5 km	10 km	5 km	5 km
16	Aan de rand van een dorp	10 km	1 km	1 km	10 km
17	Aan de rand van een dorp	10 km	5 km	5 km	5 km
18	Aan de rand van een dorp	10 km	10 km	10 km	1 km
19	Op het platteland	1 km	1 km	10 km	10 km
20	Op het platteland	1 km	5 km	1 km	5 km
21	Op het platteland	1 km	10 km	5 km	1 km
22	Op het platteland	5 km	1 km	1 km	5 km
23	Op het platteland	5 km	5 km	5 km	1 km
24	Op het platteland	5 km	10 km	10 km	10 km
25	Op het platteland	10 km	1 km	5 km	1 km
26	Op het platteland	10 km	5 km	10 km	10 km
27	Op het platteland	10 km	10 km	1 km	5 km

## APPENDIX IV

The profiles are combined to 10 different sets, with 9 choice sets of three profiles each.

Choice Set	Set	Woning 1 / Locatie 1	Woning 2 / Locatie 1	Woning 3 / Locatie 3		Choice Set	Set	Woning 1 / Locatie 1	Woning 2 / Locatie 1	Woning 3 / Locatie 3
1	1	1	24	11		46	6	21	22	15
2	1	2	16	25		47	6	1	24	2
3	1	3	23	10		48	6	5	20	14
4	1	4	21	22		49	6	4	19	9
5	1	5	19	13		50	6	7	26	16
6	1	6	18	17		51	6	17	12	27
7	1	7	20	12		52	6	11	3	8
8	1	8	14	26		53	6	13	23	25
9	1	9	15	27		54	6	10	18	6
10	2	10	24	8		55	7	19	11	16
11	2	11	6	27		56	7	8	23	18
12	2	12	3	23		57	7	25	26	13
13	2	13	2	22		58	7	17	12	27
14	2	14	4	7		59	7	20	10	3
15	2	15	26	1		60	7	6	1	9
16	2	16	21	19		61	7	4	7	15
17	2	17	9	25		62	7	2	21	22
18	2	18	5	20		63	7	5	14	24
19	3	19	11	8		64	8	23	7	27
20	3	20	13	9		65	8	5	17	2
21	3	21	15	14		66	8	4	10	19
22	3	22	4	2		67	8	1	3	16
23	3	23	5	16		68	8	26	22	20
24	3	24	7	12		69	8	21	14	12
25	3	25	1	10		70	8	8	15	18
26	3	26	17	3		71	8	13	11	9
27	3	27	18	6		72	8	24	25	6
28	4	20	3	14		73	9	6	22	26
29	4	15	7	8		74	9	2	7	23
30	4	11	21	17		75	9	20	17	27
31	4	27	10	2		76	9	3	19	8
32	4	4	23	12		77	9	18	14	25
33	4	5	19	18		78	9	16	1	11
34	4	22	16	25		79	9	21	13	24
35	4	26	6	13		80	9	15	9	12
36	4	1	9	24		81	9	4	5	10
37	5	24	26	11		82	10	8	5	13
38	5	8	10	1		83	10	1	2	17
39	5	13	18	6		84	10	4	6	12
40	5	19	2	7		85	10	27	18	7
41	5	23	15	20		86	10	3	10	23
42	5	21	22	25		87	10	20	24	19
43	5	14	17	27		88	10	9	11	14
44	5	4	5	16		89	10	16	22	15
45	5	12	9	3		90	10	21	26	25

## APPENDIX V

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### Voorkeuren koopwoningen Oost-Groningen

#### Voorwoord

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**Beste Deelnemer,**

Welkom bij mijn enquête.

Fijn dat u de tijd wilt nemen om deze enquête in te vullen. De vragenlijst is onderdeel van mijn afstudeeronderzoek voor mijn opleiding bouwmanagement aan de Technische Universiteit Eindhoven.

Ik onderzoek de woning- en woonomgevingsvoorkeuren van mensen die **willen verhuizen naar een koopwoning in Oost-Groningen**. Het onderzoeksgebied betreft een regio bestaande uit 7 gemeenten (Bellingwedde, Menterwolde, Oldambt, Pekela, Stadskanaal, Veendam en Vlagtwedde) waar **geen aardbevingen** door gasboringen plaatsvinden.

Met behulp van dit onderzoek wil ik meer te weten komen over uw woningvoorkeuren. Op basis van uw voorkeur kan de ontwikkeling van nieuwe woningen maar ook de sloop of onttrekking van bestaande woningen beter worden afgestemd op de wensen van de inwoners van Oost-Groningen. Deze informatie kan bijvoorbeeld worden gebruikt voor het ontwikkelen van nieuw woningbouwbeleid van de betrokken gemeenten, provincie en projectontwikkelaars.

Onder de deelnemers die de enquête volledig invullen en hun adres gegevens achterlaten op de laatste pagina zullen **2 waardebonnen van € 10,-** worden verloot. Het invullen van deze vragenlijst zal **ongeveer 15 minuten** in beslag nemen.

De resultaten zullen geheel **anoniem** worden verwerkt.

Ik wil u alvast hartelijk danken voor uw medewerking!

Cecile van Amerongen

**Volgende**

Ps. Mocht u nog vragen hebben dan kunt u deze kwijt op de laatste pagina van deze vragenlijst.

## Voorkeuren koopwoningen Oost-Groningen

### Introductie

Deze enquête bestaat uit drie verschillende delen:

**Het eerste deel** van de enquête:  
gaat over uw huidige huishouden, woning en woonlocatie.

**Het tweede deel** van de enquête:  
gaat over uw woonvoorkeuren voor nieuwe koopwoning.  
In dit deel van de enquête zal telkens een keuze tussen 3 woningen gemaakt moeten worden.

**Het derde deel** van de enquête:  
gaat over uw voorkeuren voor een nieuwe woonomgeving.  
In dit deel van de enquête zal wederom telkens een keuze tussen 3 woonomgevingen gemaakt moeten worden.

Vorige

Volgende

### Deel 1

#### Algemene vragen

**Wat is uw geslacht?**

- ☒ Man  
☐ Vrouw

**Wat is uw leeftijd?**

**Wat is de hoogste opleiding die u afgerond heeft?**

- ☐ Basisschool/Lagere school
- ☐ Voorbereidend middelbaar beroepsonderwijs(v(m)bo, Its, lbo, huishoudschool)
- ☐ Middelbaar algemeen voortgezet onderwijs (mavo, (m)ulo)
- ☐ Hoger algemeen en voorbereidend wetenschappelijk onderwijs (havo, vwo, hbs)
- ☐ Middelbaar beroepsonderwijs (mbo, mts)
- ☐ Hoger beroepsonderwijs (hbo, pabo, hts, heao)
- ☐ Wetenschappelijk onderwijs (universiteit, gepromoveerd)
- ☐ Anders

**Welke situatie is op u van toepassing?**

Kies de situatie die het meest van toepassing is.

- ☐ Parttime werkverband (< 32 uur per week)
- ☐ Fulltime werkverband (≥ 32 uur per week)
- ☐ Student
- ☐ Vrijwilliger
- ☐ Ik doe het huishouden
- ☐ Arbeidsongeschikt
- ☐ Met pensioen of VUT
- ☐ Werkzoekend
- ☐ Anders

Vorige

Volgende

## Voorkeuren koopwoningen Oost-Groningen

### Algemene vragen

De volgende vragen gaan over uw huishouden.

**Hoe is uw huishouden samengesteld?**

- ☐ Alleenstaand / Single
- ☐ Getrouwd / Samenwonend - Geen kinderen
- ☐ Getrouwd / Samenwonend - 1 kind
- ☐ Getrouwd / Samenwonend - 2 kinderen
- ☐ Getrouwd / Samenwonend - 3 of meer kinderen
- ☐ Eenoudergezin - 1 kind
- ☐ Eenoudergezin - 2 kinderen
- ☐ Eenoudergezin - 3 of meer kinderen
- ☐ Anders

**Zou u binnen nu en 2 jaar willen verhuizen naar een koop- of huurwoning?**

- ☐ Nee ik wil niet verhuizen.
- ☐ Ja ik wil verhuizen - Naar een koopwoning
- ☐ Ja ik wil verhuizen - Naar een huurwoning
- ☐ Ja ik wil verhuizen - Naar een bestaand huishouden (samenwonen)

**Als u gaat verhuizen blijft de samenstelling van uw huishouden dan hetzelfde?**

- ☐ Niet van toepassing (ik verhuis niet)
- ☐ Ja
- ☐ Nee, graag hieronder aangeven wat er verandert:

**Als u verhuisd bent, bent u dan een...?**

- ☐ Starter (u laat geen andere woning achter)
- ☐ Doorstromer (u laat een andere woning achter)
- ☐ Empty Nester (leeg nest / uw kinderen zijn al verhuisd)
- ☐ Niet van toepassing (ik verhuis niet)
- ☐ Anders

Vorige

Volgende

## Voorkeuren koopwoningen Oost-Groningen

### Algemene vragen

De volgende vragen gaan over uw huidige woning.  
Kies het antwoord dat het meest overeenkomt met uw situatie.

#### Is uw huidige woning een koop- of huurwoning?

- ☐ Koop
- ☐ Huur

#### Indien Koop: Wat is de waarde van uw huidige koopwoning?

- ☐ € 125.000 of minder
- ☐ € 125.000 tot € 175.000
- ☐ € 175.000 tot € 225.000
- ☐ € 225.000 of meer
- ☐ Niet van toepassing

#### Indien Huur: Wat is de huurprijs per maand?

- ☐ € 403,06 of minder (kwaliteitsgrens)
- ☐ € 403,06 tot € 576,87 (huursubsidie grens laag - 1 tot 2 persoonshuishouden)
- ☐ € 403,06 tot € 618,24 (huursubsidie grens hoog - 3 of meer persoonshuishouden)
- ☐ € 710,68 of minder (liberalisatiegrens)
- ☐ € 710,68 of meer (liberalisatiegrens)
- ☐ Niet van toepassing

#### Wat is uw huidige woningtype?

- ☐ Vrijstaande woning
- ☐ Twee-onder-een-kap woning
- ☐ Rijwoning
- ☐ Hoekwoning
- ☐ Appartement
- ☐ Anders: graag hieronder aangeven:

#### Wat is de grootte van uw huidige woning?

- ☐ 75 m2 of kleiner
- ☐ 75 - 125 m2
- ☐ 125 - 175 m2
- ☐ 175 m2 of groter

#### Wat is het bouwjaar van uw huidige woning?

- ☐ voor 1945
- ☐ tussen 1945 en 1975
- ☐ tussen 1976 en 1990
- ☐ tussen 1990 en 2010
- ☐ na 2010

#### Is uw woning gelijkvloers?

Met de woonkamer, keuken, badkamer en minimaal een van de slaapkamers op de begane grond.

- ☐ Ja
- ☐ Nee (het is **niet** mogelijk om deze ruimten op dezelfde verdieping te realiseren)
- ☐ Nee (het is **wel** mogelijk om deze ruimten op dezelfde verdieping te realiseren)

Vorige

Volgende

## Voorkeuren Koopwoningen Oost-Groningen

### Algemene vragen

De volgende vragen gaan over uw huidige woonomgeving.  
Kies het antwoord dat het meest overeenkomt met uw situatie.

#### Wat is uw postcode?

Vul de 4 cijfers en de 2 letters van uw postcode in.

#### Wat is de afstand van uw huidige woning tot een winkel voor de dagelijkse boodschappen?

Bijvoorbeeld een supermarkt.

- ☐ 500 meter of dichterbij
- ☐ 500 meter tot 1 km
- ☐ 1 tot 5 km
- ☐ 5 tot 10 km
- ☐ 10 km of verder

#### Wat is de afstand van uw huidige woning tot een medische voorziening?

Bijvoorbeeld een huisarts.

- ☐ 500 meter of dichterbij
- ☐ 500 meter tot 1 km
- ☐ 1 tot 5 km
- ☐ 5 tot 10 km
- ☐ 10 km of verder

#### Wat is de afstand van uw huidige woning tot een basisschool?

- ☐ 500 meter of dichterbij
- ☐ 500 meter tot 1 km
- ☐ 1 tot 5 km
- ☐ 5 tot 10 km
- ☐ 10 km of verder

#### Wat is de afstand van uw huidige woning tot de dichtstbijzijnde vrienden / familie?

- ☐ 500 meter of dichterbij
- ☐ 500 meter tot 1 km
- ☐ 1 tot 5 km
- ☐ 5 tot 10 km
- ☐ 10 km of verder

Vorige

Volgende

## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

#### Keuze experiment

Dit is het tweede deel van de vragenlijst. Veronderstel bij de volgende vragen dat u een nieuwe woning gaat kopen.

In dit deel vraag ik u een aantal keer een keuze te maken tussen drie verschillende koopwoningen. De woningen verschillen op een aantal kenmerken, zoals:

De aankoop**prijs**, het **woningtype**, de **grootte** van de woning, het **bouwjaar** en of een woning **gelijkvloers** is (met zowel de woonkamer, keuken, slaapkamer en de badkamer op de begane grond)

U kiest telkens de voor u meest aantrekkelijke woning van de drie. Heeft u geen voorkeur, dan kunt u kiezen voor de optie '**Geen van deze woningen**'. Vervolgens geeft u aan of u bereid bent om de geselecteerde woning te kopen.

Vorige Volgende

Er volgt eerst een voorbeeldvraag.

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

#### Voorbeeldvraag

Ik geef u steeds drie woningopties.

**STEL:** In dit voorbeeld vindt u woning 1 het aantrekkelijkst en zou u deze woning willen kopen.

Selecteer bij de volgende vragen de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 125.000	€ 175.000	€ 225.000	
Woningtype	Vrijstaande woning	Rij-/Hoekwoning	Twee-onder-een-kap woning	
Grootte	Gemiddeld (125m2)	Groot (175m2)	Gemiddeld (125m2)	
Bouwjaar	Voor 1945	Voor 1945	Na 1990	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee	Ja	Nee (wel gelijkvloers te maken)	
Welke woning vindt u het aantrekkelijkst?	X	O	O	O
Zou u deze woning kopen?	Ja X	Nee O		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 225.000	€ 225.000	€ 175.000	
Woningtype	Twee-onder-een-kap	Rij-/Hoekwoning	Vrijstaand	
Grootte	Groot (175 m2)	Gemiddeld (125 m2)	Gemiddeld (125 m2)	
Bouwjaar	Na 1990	Na 1990	Na 1990	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee (wel gelijkvloers te maken)	Nee (wel gelijkvloers te maken)	Ja	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 125.000	€ 175.000	€ 125.000	
Woningtype	Rij-/Hoekwoning	Vrijstaand	Vrijstaand	
Grootte	Gemiddeld (125 m2)	Klein (75 m2)	Klein (75 m2)	
Bouwjaar	Voor 1945	1945 - 1990	Voor 1945	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Ja	Nee	Ja	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 175.000	€ 175.000	€ 125.000	
Woningtype	Twee-onder-een-kap	Rij-/Hoekwoning	Twee-onder-een-kap	
Grootte	Klein (75 m2)	Groot (175 m2)	Groot (175 m2)	
Bouwjaar	Na 1990	Na 1990	Voor 1945	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Ja	Ja	Ja	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 225.000	€ 125.000	€ 125.000	
Woningtype	Vrijstaand	Vrijstaand	Rij-/Hoekwoning	
Grootte	Klein (75 m2)	Gemiddeld (125 m2)	Klein (75 m2)	
Bouwjaar	Na 1990	1945 - 1990	Na 1990	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee (wel gelijkvloers te maken)	Nee (wel gelijkvloers te maken)	Nee	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 225.000	€ 175.000	€ 225.000	
Woningtype	Twee-onder-een-kap	Twee-onder-een-kap	Vrijstaand	
Grootte	Gemiddeld (125 m2)	Groot (175 m2)	Gemiddeld (125 m2)	
Bouwjaar	1945 - 1990	1945 - 1990	Voor 1945	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Ja	Nee	Nee	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 225.000	€ 225.000	€ 225.000	
Woningtype	Vrijstaand	Twee-onder-een-kap	Rij-/Hoekwoning	
Grootte	Groot (175 m2)	Klein (75 m2)	Klein (75 m2)	
Bouwjaar	1945 - 1990	Voor 1945	1945 - 1990	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Ja	Nee	Ja	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 175.000	€ 175.000	€ 225.000	
Woningtype	Twee-onder-een-kap	Rij-/Hoekwoning	Rij-/Hoekwoning	
Grootte	Gemiddeld (125 m2)	Gemiddeld (125 m2)	Groot (175 m2)	
Bouwjaar	Voor 1945	1945 - 1990	Voor 1945	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee (wel gelijkvloers te maken)	Nee	Nee	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 125.000	€ 125.000	€ 175.000	
Woningtype	Twee-onder-een-kap	Twee-onder-een-kap	Rij-/Hoekwoning	
Grootte	Klein (75 m2)	Gemiddeld (125 m2)	Klein (75 m2)	
Bouwjaar	1945 - 1990	Na 1990	Voor 1945	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee (wel gelijkvloers te maken)	Nee	Nee (wel gelijkvloers te maken)	
Welke woning vindt u het aantrekkelijkst?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 2: Woningkeuze

Selecteer de woning die u het meest aantrekkelijk vindt.

Kenmerken	Woning 1	Woning 2	Woning 3	Geen van deze woningen
Prijs	€ 175.000	€ 125.000	€ 125.000	
Woningtype	Vrijstaand	Rij-/Hoekwoning	Vrijstaand	
Grootte	Groot (175 m2)	Groot (175 m2)	Groot (175 m2)	
Bouwjaar	Voor 1945	1945 - 1990	Na 1990	
Gelijkvloers Woonkamer, slaapkamer en badkamer op begane grond	Nee (wel gelijkvloers te maken)	Nee (wel gelijkvloers te maken)	Nee	
Welke woning vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u deze woning kopen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Dit is het derde en laatste deel van de enquête. Veronderstel bij de volgende vragen dat u een nieuwe woning koopt op een nieuwe locatie.

In dit deel vraag ik u 9 keer een keuze te maken tussen drie verschillende locaties. De locaties verschillen op een aantal kenmerken, zoals:

niveau van **stedelijkheid**, **afstand tot dagelijkse winkels** zoals een supermarkt, **afstand tot medische voorzieningen** zoals een huisarts, **afstand tot basisscholen** en de **afstand tot vrienden en of familie**.

U kiest vervolgens de voor u meest aantrekkelijke woonlocatie van de drie. Heeft u geen voorkeur, dan kunt u kiezen voor de optie '**Geen van deze locaties**'. Vervolgens geeft u aan of u bereid bent om naar de geselecteerde locatie te verhuizen.

Vorige Volgende

Er volgt eerst een voorbeeldvraag.

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

### Voorbeeldvraag

Ik geef u steeds drie locatieopties. **STEL:** In dit voorbeeld vindt u locatie 1 het aantrekkelijkst en zou u naar deze locatie willen verhuizen.

Selecteer bij de volgende de locatie die u het aantrekkelijkst vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>In een dorpskern</i>	<i>Aan de rand van een dorp</i>	<i>Op het platteland</i>	
Afstand tot dagelijkse winkels (supermarkt)	1 km	1 km	1 km	
Afstand tot medische voorzieningen (huisarts)	1 km	5 km	10 km	
Afstand tot basisscholen	1 km	1 km	5 km	
Afstand tot vrienden / familie	5 km	5 km	10 km	
Welke locatie vindt u het aantrekkelijkst?	X	O	O	O
Zou u naar deze locatie willen verhuizen?	Ja X	Nee O		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>In een dorpskern</i>	<i>In een dorpskern</i>	<i>Aan de rand van een dorp</i>	
Afstand tot dagelijkse winkels (supermarkt)	5 km	5 km	10 km	
Afstand tot Medische voorzieningen (huisarts)	1 km	5 km	1 km	
Afstand tot basisscholen	5 km	10 km	1 km	
Afstand tot vrienden / familie	10 km	5 km	10 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>In een dorpskern</i>	<i>Aan de rand van een dorp</i>	<i>In een dorpskern</i>	
Afstand tot dagelijkse winkels (supermarkt)	10 km	1 km	1 km	
Afstand tot Medische voorzieningen (huisarts)	5 km	1 km	1 km	
Afstand tot basisscholen	1 km	5 km	1 km	
Afstand tot vrienden / familie	1 km	5 km	1 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Aan de rand van een dorp</i>	<i>In een dorpskern</i>	<i>In een dorpskern</i>	
Afstand tot dagelijkse winkels (supermarkt)	1 km	10 km	1 km	
Afstand tot Medische voorzieningen (huisarts)	10 km	10 km	10 km	
Afstand tot basisscholen	1 km	5 km	10 km	
Afstand tot vrienden / familie	10 km	10 km	5 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Aan de rand van een dorp</i>	<i>Aan de rand van een dorp</i>	<i>In een dorpskern</i>	
Afstand tot dagelijkse winkels (supermarkt)	5 km	10 km	5 km	
Afstand tot Medische voorzieningen (huisarts)	1 km	10 km	10 km	
Afstand tot basisscholen	10 km	10 km	1 km	
Afstand tot vrienden / familie	1 km	1 km	1 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Aan de rand van een dorp</i>	<i>Aan de rand van een dorp</i>	<i>Op het platteland</i>	
Afstand tot dagelijkse winkels (supermarkt)	5 km	10 km	10 km	
Afstand tot Medische voorzieningen (huisarts)	5 km	5 km	10 km	
Afstand tot basisscholen	1 km	5 km	1 km	
Afstand tot vrienden / familie	10 km	5 km	5 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Op het platteland</i>	<i>In een dorpskern</i>	<i>In een dorpskern</i>	
Afstand tot dagelijkse winkels (supermarkt)	1 km	1 km	10 km	
Afstand tot Medische voorzieningen (huisarts)	1 km	5 km	1 km	
Afstand tot basisscholen	10 km	5 km	10 km	
Afstand tot vrienden / familie	10 km	10 km	5 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Op het platteland</i>	<i>Op het platteland</i>	<i>Op het platteland</i>	
Afstand tot dagelijkse winkels (supermarkt)	1 km	5 km	10 km	
Afstand tot Medische voorzieningen (huisarts)	10 km	1 km	1 km	
Afstand tot basisscholen	5 km	1 km	5 km	
Afstand tot vrienden / familie	1 km	5 km	1 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Op het platteland</i>	<i>Aan de rand van een dorp</i>	<i>Op het platteland</i>	
Afstand tot dagelijkse winkels (supermarkt)	5 km	5 km	1 km	
Afstand tot Medische voorzieningen (huisarts)	5 km	10 km	5 km	
Afstand tot basisscholen	5 km	5 km	1 km	
Afstand tot vrienden / familie	1 km	5 km	5 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Voorkeuren Koopwoningen Oost-Groningen

### Deel 3: Woonlocatie

Selecteer de locatie die u het meest aantrekkelijk vindt.

Kenmerken	Locatie 1	Locatie 2	Locatie 3	Geen van deze locaties
Stedelijkheid	<i>Op het platteland</i>	<i>Op het platteland</i>	<i>Aan de rand van een dorp</i>	
Afstand tot dagelijkse winkels (supermarkt)	5 km	10 km	1 km	
Afstand tot Medische voorzieningen (huisarts)	10 km	5 km	5 km	
Afstand tot basisscholen	10 km	10 km	10 km	
Afstand tot vrienden / familie	10 km	10 km	1 km	
Welke locatie vindt u het aantrekkelijkst?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zou u naar deze locatie willen verhuizen?	Ja <input type="radio"/>	Nee <input type="radio"/>		

Vorige

Volgende

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## Einde

### Enquête Voorkeuren Koopwoningen Oost-Groningen

Dit is het einde van de enquête.

Ik wil u van harte bedanken voor uw medewerking!

Als u kans wilt maken op een van de **waardebonnen** dan kunt u hieronder uw naam en adresgegevens achterlaten (straat, huisnr, postcode, woonplaats en evt. emailadres).

Naast uw adresgegevens kunt u hieronder ook eventuele opmerkingen of vragen over deze enquête kwijt.

Met vriendelijke groet,

Cecile van Amerongen  
Student Construction Managment & Engineering  
Technische Universiteit Eindhoven

c.v.v.amerongen@student.tue.nl

Vorige

Volgende

Berg Enquête System © 2007 Design Systems

## Voorkeuren Koopwoningen Oost-Groningen

### Onderzoek Cecile van Amerongen

Bedankt voor het invullen van de enquête.

U mag het venster nu sluiten.

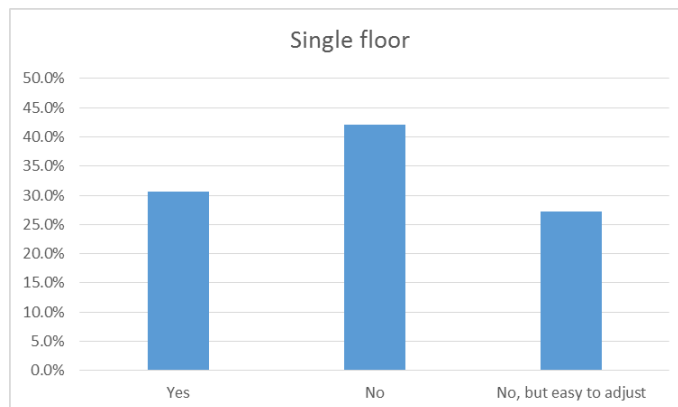
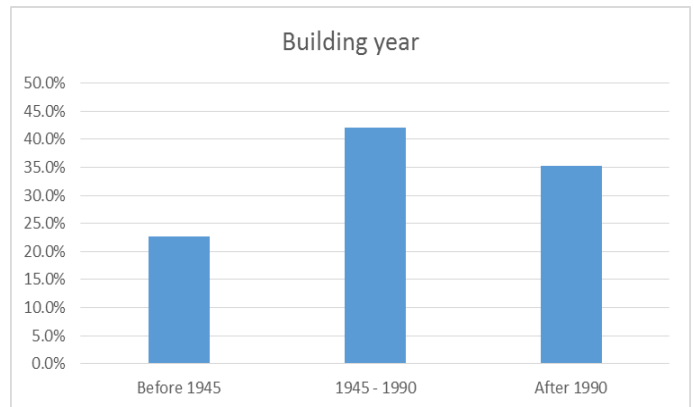
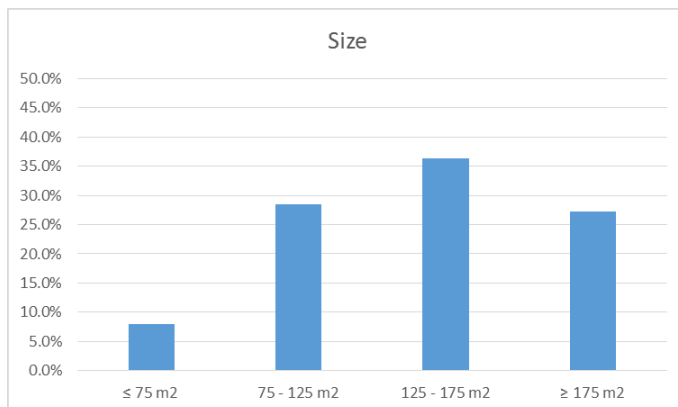
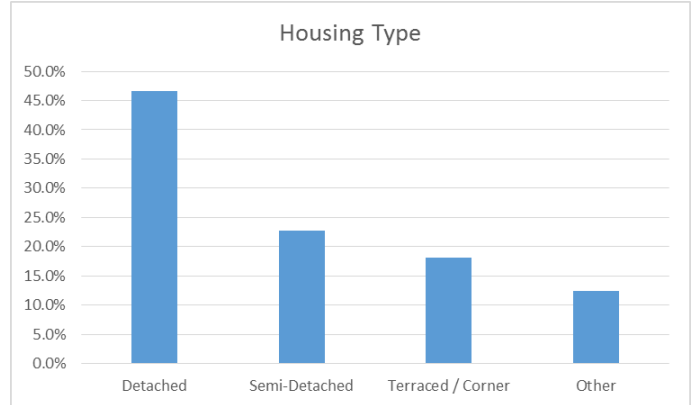
Vorige

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## APPENDIX VI

Housing characteristics of current housing situation of the respondents.

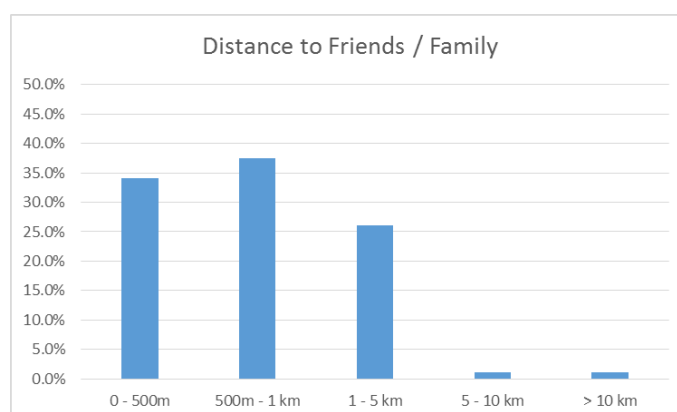
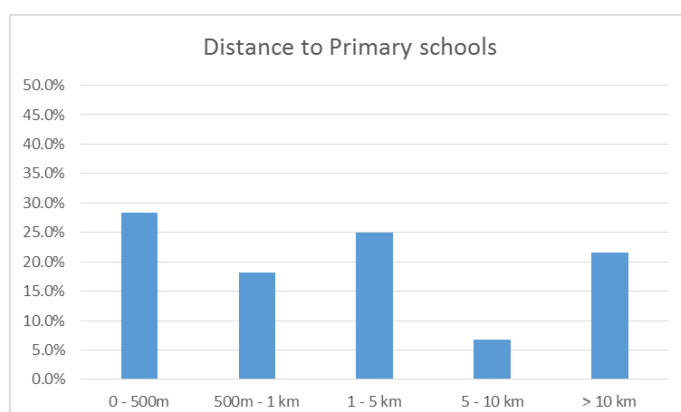
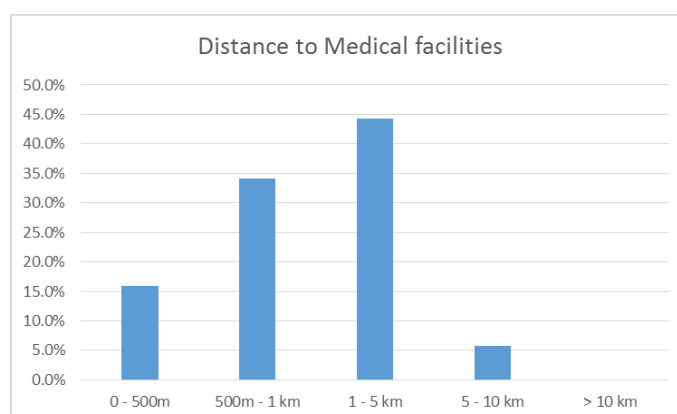
The characteristics are: Price, Housing type, size, building year and whether it is on a single floor.



## APPENDIX VII

Location characteristics of current housing location of the respondents.

The relative distance to shops, medical facilities, primary schools and friends / family is presented for all respondents. Besides this the current home town of 67 respondents in East-Groningen is presented. Other respondents are currently not living in East-Groningen.

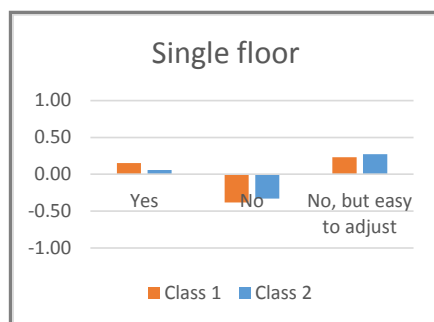
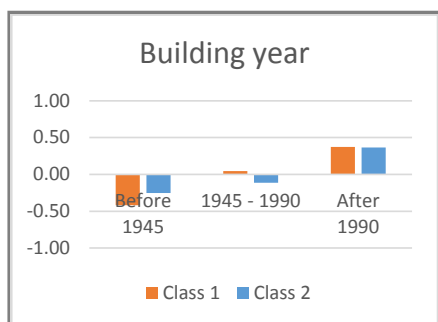
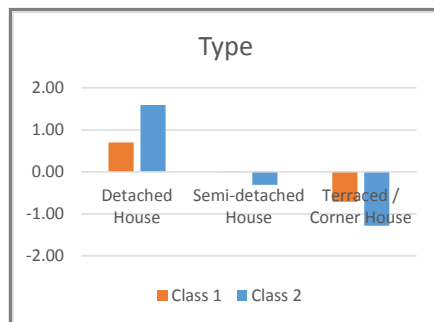
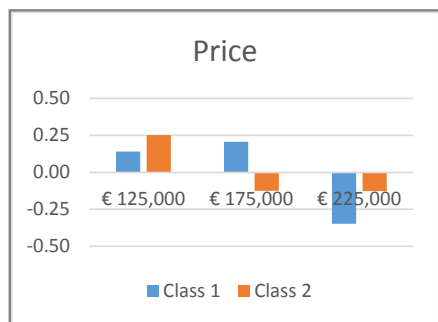


Town	No. of Inhabitants	No. of Respondents
Veendam	27,920	5
Stadskanaal	19,895	3
Winschoten	18,205	12
Ter Apel	9,290	18
Oude Pekela	8,080	8
Musselkanaal	7,490	1
Muntendam	4,650	1
Blijham	4,010	3
Nieuwe Pekela	3,990	6
Onstwedde	2,850	1
Scheemda	2,445	3
Finstewolde	2,355	1
Westerlee	1,570	2
Meeden	1,475	1
Drieborg	515	1
Borgercompagnie	430	1
Total	115,170	67

## APPENDIX VIII

Latent Class attribute level preferences.

### Housing



### Location

