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Clemens Deilmann, Oliver Lerbs,
Maja Lorbek (Eds.)

Single-Family Homes under Pressure?

1st Homes-uP International Conference,
October 2016
Proceedings



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Editorial

Clemens Deilmann, Oliver Lerbs, Maja Lorbek

A consortium of German research institutes and international partners is currently conducting research on future challenges for single-family homes from an interdisciplinary perspective. The project 'Homes-uP? Single-Family Homes under Pressure?', funded by the Leibniz Association is next to research also based on a range of networking activities. One such event was the conference in Mannheim, jointly organized by the Leibniz Institute of Ecological Urban and Regional Development (IOER), Dresden and the Centre for European Economic Research (ZEW), Mannheim. The conference, which took place on 13th and 14th October 2016, showcased new international research on the specifics of and the challenges affecting single-family homes and suburban development. Conference participants came from a range of disciplines, including urban planning, economics, architecture, and social science under the premise of sustainable use of the built environment. In the introduction, Clemens Deilmann presented the research agenda and preliminary results of the Homes-uP project as well as a general introduction to the topic of single-family homes and future challenges arising from demographic and socio-structural change and a shift in user preferences.

Christine Whitehead, professor emeritus of the London School of Economics, delivered the keynote lecture. She posed a provocative question in her keynote lecture: 'The Single Family Home – No Longer a Superior Good?' In her lecture, she delivered a highly insightful characterisation of the single-family home and a concise summary of future changes and challenges affecting this particular type of the housing stock. Additionally, she pointed out the changes in habitation and accommodation of different households during the life course of the historic detached homes. Professor Whitehead concluded her lecture by addressing future development. The value of existing homes is related to their capacity to adapt and accessibility of their location. While the attributes of single-family homes remain highly desirable, the demand for more homes will not increase despite higher real incomes.

The two-day conference was organized in thematic sessions devoted to different topics. The issues addressed

included cultural and structural classification of the single-family housing stock, sustainability and resources, trajectories of use, actors and stakeholders as well the topics of valuation and market implications.

During the first session, Oswald Devisch (co-author Barbara Roosen) discussed the observation of subtle interventions within the sphere of residential subdivisions, which can be implemented in order to enhance daily interactions of inhabitants. Mathias Jehling studied the dynamics of habitation and suburban building stock by analysis of geospatial topographic vector data and historical topographic raster maps. He identified specific spatial and temporal patterns, which are typical for suburban areas. In session 2, devoted to sustainability and resources, Katherin Wagenknecht and Niklas Heller presented an ethnographically based examination of material flows in detached houses. Michiel Daams presented an interesting and provocative analysis of land use by the rich. According to the study authors, Daams and Sijtsma, cities need to provide a high degree of urbanity in addition to abundance of green space. Actors and stakeholders were addressed in the third session Alessandro Coppola presented the informal production of family homes during the expansion era in Rome in the post-war era and later legalisation after the fact. Despite past success and adaptability of the Italian welfare model based on the family and the family home, this concept is increasingly challenged due to diversification of lifestyles and increased



Fig 1: Keynote Speaker Christine Whitehead from London School of Economics (source: Erich Dichiser, ZEW)

mobility requirements. Inken Tintemann also explored the single-family home from the viewpoint of its original intended user, the family. Tintemann suggested that suburban areas can be redeveloped by enhancing this specific trait and by providing additional joint features for this particular user group. Session 4 was devoted to exploration of valuation and market impacts. Sören Gröbel studied the impact of regional demand and supply factors on house depreciation, stating that depreciation rates are housing market-specific and correlate with indicators of excess supply such as a change in newly developed land and the share of older single-family houses in the total housing stock. According to Gröbel, heterogeneous price responses to demand and supply shocks lead to local redistributions of housing wealth. Wolfgang Maennig & Waldemar Beimer examined factors changing the sales prices of single-family homes in Berlin relative to the sales prices of apartments within a long period of time spanning back to 1990. The authors identified both an increasing preference for smaller and older homes as well as price development in alignment with multi-family dwelling units in the same neighbourhoods, indicating that single-family homes have not generally run out of fashion in the Berlin market.

During session number 5 which took place on the second day of the conference, spatial effects of planning policy were discussed. Jan Polivka provided insight on maturation cycle specifics in suburban areas dominated by single-family homes. Empirical evidence in selected case studies was used to identify transition potentials. Polivka suggested several strategies for enhancing the resilience in the socio-ecological sphere of suburban detached homes, including redeployment of assets, collaboration across institutions and implementation of advocacy of place. Paris Magali (co-author Rainer Kazig) presented the concept of soft densification, by examining urban microscale development in Lyon, France and Munich, Germany. The results imply that redensification of single-family home areas calls for specific policy measures for these areas, in order to enable viable development of existing neighbourhoods and foster interaction between new and old inhabitants.

Session 6 focused on governance and strategy. Francesca Pigni presented research, which was conducted on the micro level of existing detached houses currently in a “limbo” condition of underuse, lack of maintenance and insufficient communal space. As a solution, Pigni proposed an implementation of both micro and macro

strategies based on the involvement of inhabitants and municipalities. Hannes Müller’s presentation focused on the topic of ageing society and the implications for single-family home neighbourhoods. Two Swiss case studies, which were based on involvement of local population, and explored solutions for ‘ageing in place’ were presented. Dominik Weiß, with co-author Theo Kötter, proposed the use of scenarios to develop adequate governance strategies for single-family areas, which need, in order to tackle future challenges, both detailed knowledge of the local situation, as well as an appropriate mix of sovereign, cooperative and fiscal instruments. Ari Laitala used Finnish open data on prices of house transactions to develop a practical and evidence-based approach for the appraisal of single-family home values.

In a concluding panel discussion, discussants from Japan (Akito Murayama), Spain (Montserrat Pareja-Eastaway), Italy (Federico Zanfi) and Germany (Johann Jessen and Oliver Lerbs) addressed the challenges affecting single-family homes from their local perspectives. The discussion revealed that different conditions in these countries require specific solutions tailored to local context and tradition. However, panel discussants unanimously agreed that different methods are required to provide an in-depth knowledge on the specifics of this type of housing and an interdisciplinary approach is necessary when developing solutions and strategies to tackle future challenges such as demographic change, shifts in user requirements, prevention of underuse and vacancy.

In addition to research on the challenges of the German single-family housing stock and possible solutions, the Homes-uP project will continue its networking activities next year. In 2017, the final scientific conference will take place in Dresden, during which results from the project will be presented. The conference will also provide an opportunity for international researchers to showcase their explorations of the single-family house theme. Planning for the conference includes networking and matchmaking activities for initiation of future research collaboration.

Homes-uP. Single-Family Homes under Pressure? Project Summary and Preliminary Results

Clemens Deilmann, Leibniz Institute of Ecological Urban and Regional Development, Germany

In 2011, there were 13.5 millions of single-family homes¹ in Germany (Statistisches Bundesamt 2013). Single-family homes remain, according to German surveys on housing preferences, the most popular form of housing (prognos and IfD Allensbach 2014). However, there is increasing evidence that this segment of the housing stock is under pressure. In view of wide-ranging demographic and structural changes, the existing stock of single-family homes in many European countries may no longer be adequate to meet future needs.

The traditional nuclear family is no longer the prevailing household form (Statistisches Bundesamt 2011). House-

holds and family constellations underwent a considerable transformation in the closing decades of the twentieth century, changes that are still ongoing today. In the wake of individualization (Beck & Beck-Gernsheim 2002) and demographic shifts, households have diversified, grown older and smaller, and their number is expected to continue to increase (Waltersbacher 2006; European Commission 2011; Jansen 2012; Effenberger, Banse & Oertel 2014).

Previous research addressed the risk of oversupply in the stock of single-family homes, particularly in structurally weak regions (Wüstenrot Stiftung 2012; Berndgen-Kaiser et al. 2014). Stagnating or dropping prices, difficulties in selling, are no longer a rarity outside core regions of economic growth. Mid- to long-term challenges include a rise in underuse and vacancies. The density of settlement areas (land use per person) has direct implications on the number of connected services, the length of technical infrastructure per service and the use intensity of these services.

Municipalities will be faced with increasing cost of infrastructure maintenance and the question of how to avoid raising fees in areas with underuse and vacancies. In addition to cost effects, this also has implications for the use of natural resources.

¹ Eurostat defines dwelling as "a room or a suite of rooms in a permanent building designed for habitation by a private household. The most common forms of dwelling include detached houses, semi-detached or terraced houses, flats or bedsits. Dwellings should have separate access either to the road or to a communal space within a building (a staircase, corridor or passageway). Dwellings may be classified as occupied, secondary, seasonal or unoccupied. They are considered to be occupied if they provide the 'usual place of residence' to one or more persons' (Eurostat 2015)". In this project summary, the term 'single-family home' will be used to describe detached, semi-detached and terraced houses consisting of one dwelling. Homes-uP research is limited to detached, semi-detached and terraced houses called "Einfamilienhaus" in German, excluding "Zweifamilienhäuser" (two family homes with dwellings on separate floors).

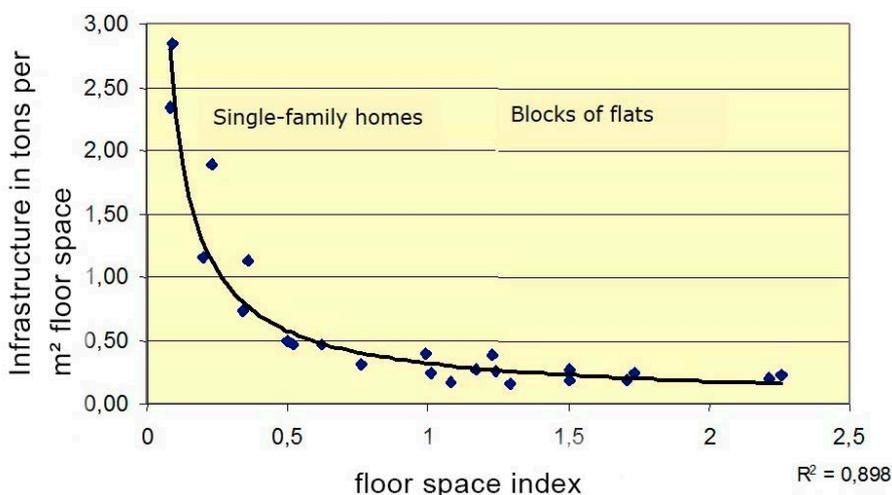


Fig 2: Urban structural types and infrastructure: from 1.5 tons onward - more material in roads, than in buildings (source: Schiller, G. (2007): Urban infrastructure: challenges for resource efficiency in the building stock In: Building Research & Information 35 (4): 399–411)

Figure 2 illustrates the exponential rise in infrastructure efforts per m² floor space in low-density areas. This correlation implies that a bisection of use intensity in low-density areas doubles the material input on high scale. The number of infrastructure users will decline, the material input and land-use will remain, but in relative terms, it rises per source unit.

Infrastructure costs are just one aspect and motivation to investigate potential and risks associated with single-family home areas.

Interdisciplinary and international project

The ongoing project “Homes-uP. Single-Family Homes under Pressure?” (2015-2017), funded by the Leibniz Association, is exploring these challenges from an interdisciplinary perspective. In the national consortium, economists, urban planners, sociologists and architects are conducting research and collaborating, while the international partners are contributing to comparative perspective on the topic of single-family homes. The Leibniz Institute of Ecological Urban and Regional Development is acting as project leader.

Project partners in the national consortium include ifo (Leibniz Institute for Economic Research Dresden

branch), ILS (Research Institute for Regional and Urban Development) Dortmund, ISOE (The Institute for Social-Ecological Research) Frankfurt am Main and ZEW (Research Institute for Regional and Urban Development) Mannheim. Huibert A. Haccou (Saxion/ University of Applied Sciences, Netherlands), Bernadette Hanlon (The Ohio State University, Knowlton School of Architecture), Donald Houston (University of Portsmouth / formerly University of Glasgow, School of Social and Political Sciences), Akito Murayama (University of Tokyo, Department of Urban Engineering), Montserrat Pareja-Eastaway (University of Barcelona) Federico Zanfi (Politecnico di Milano) and Christine Whitehead (London School of Economics and Social Sciences) constitute the core of the project’s international committee.

Objectives and outcome

Based on demographic extrapolations, surveys on residential preferences, and assessments of the determinants of supply and demand, the project’s outcome will provide:

- a description of trends and changes in the development of traditional and novel SFH user groups and their housing preferences on the one hand and

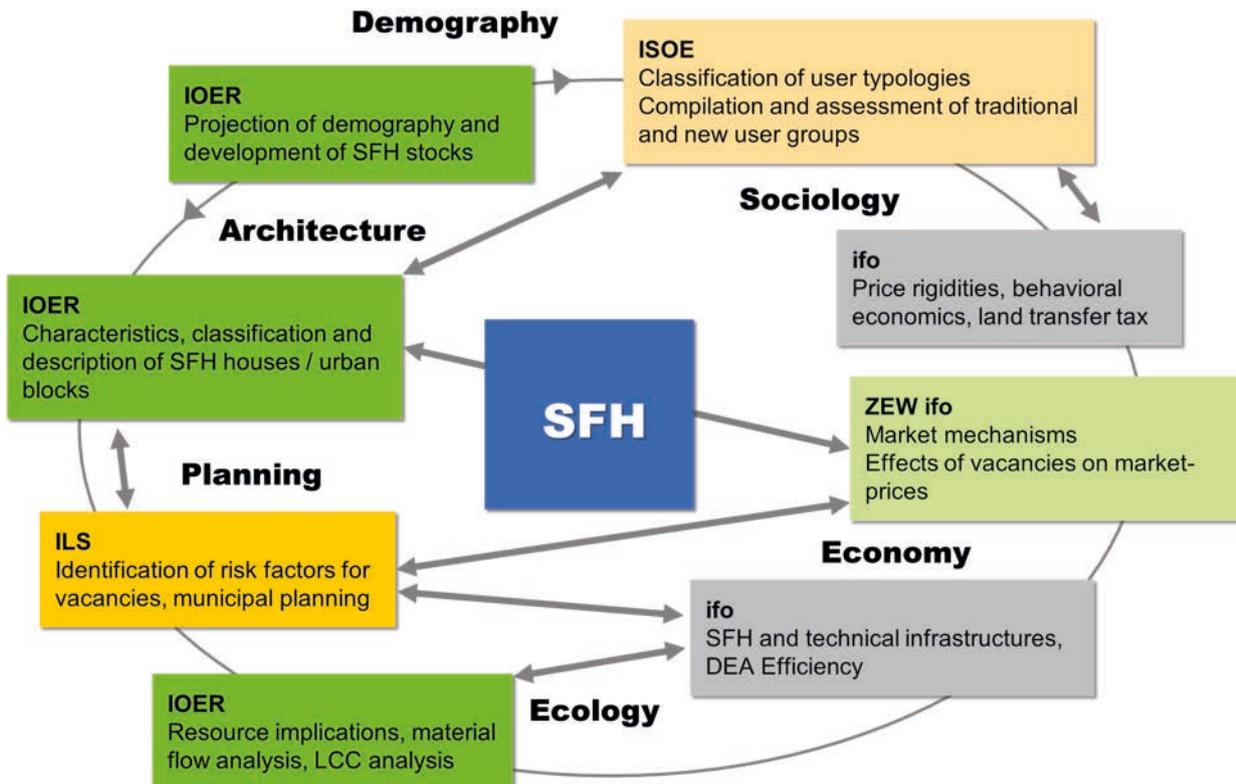


Fig 3: Project partners (national consortium), work packages and collaboration (source: Clemens Deilmann, IOER)

the characteristics of current SFH building stocks on the other,

- an understanding of the effects of these changes for the matching of supply and demand, as well as for prices and vacancies, and the implications for the use of natural resources and resulting development challenges, and
- identification of possible development scenarios and approaches to action.

The project consists of four work packages of which the first three address the above quoted research questions; the fourth work package encompasses the networking activities.

User groups, user preferences and single-family home stocks

How will traditional SFH user groups develop against the background of demographic change? Which effects will new patterns of living and new residential concepts have on future user preferences and the development of new user groups for SFH? Which regionally differentiated structures will the SFH stock have in Germany? What will the developments look like compared with the situation in Europe and internationally? Which specific challenges will result in different international contexts?

Market mechanisms and resource related implications

What effect will prospective economic, demographic and socio-cultural developments have on the demand for SFH? Could there be an increasing divergence between supply and demand due to downward price rigidities? What are the consequences of spatially selective devaluation for private wealth and public budgets? Which implications will this involve for the use of natural resources (energy use in the housing stock, land-use and material intensity per capita, material flows for technical infrastructure and construction activity) over the long-term perspective? To what extent are regional disparities recognizable?

Scenarios, approaches to action, and instruments

Which short and long-term approaches to action can be identified on the basis of varying, and possibly even contradictory scenarios of the development paths? Which leverage points emerge for problem-oriented municipal strategies? Which examples for new orientation can be derived from international comparisons?

An important objective of the research project is the interdisciplinary exchange within these three work packages.

State of research

Economists used data on house transactions and deployed the hedonic regression method to explore the correlations between price development and vacancies. The preliminary hypothesis of price-depressing effects of vacancies in the neighbourhood of detached housing was confirmed. Similarly, house transaction data was used in hedonic regression analysis with the goal to assess the impact of land transfer tax on the single-family house market. Results have shown that the increase in the land transfer tax provoked massive anticipation effects and subsequent slowdown of sales. Currently the economists are starting to explore novel financial instruments and ownership concepts aimed at resolving current and expected future deficiencies in the market for single-family housing. Furthermore, the implications of price rigidities in the single-family housing market will be explored from the viewpoint of behavioural economics.

Sociologists and architects focused on homeowners who only recently – within the last five years – acquired second hand homes and adapted their used property to current requirements. Both disciplines collaborated during field analysis of user-induced transformations in these recently bought and renovated detached homes. During on-site visits, semi-structured interviews and walk-troughs were conducted during which renovation and adaptation measures were documented. Observed transformations and emergent user preferences are currently being classified and interpreted. Results from this analysis, conducted in towns with an adequate supply of affordable detached homes, imply the continued significance of self-provision in this part of the housing sector (Duncan and Rowe 1993). Preliminary outcome has shown that smaller, traditionally constructed and affordable detached homes near urban core areas attract a wide range of different household types and cater less to traditional families.

Urban planners are currently investigating the municipal perspective through expert interviews in several towns in Eastern and Western Germany, which were selected according to preliminary risk indicators. At a later stage, subsidized programs for urban regeneration, subsidies and incentives for private homeowner-

ship and renovation will be critically assessed in order to identify strategies and planning instruments which can consolidate development of smaller towns and prolong the service life of existing detached building stock in well serviced areas near the town centre.

Preliminary results can be summarized as follows:

- Vacancies in single-family homes are a specific problem category and hard to pinpoint due to hiding, hibernating, diverse, disperse characteristics of non-use. Vacancies are linked to highly heterogeneous forms and structures.
- Macro, meso, micro analyses are required to characterize the specifics of single-family homes, and mid- to long-term measures will predominantly rely on subtle strategies and micro interventions.
- Single-family housing stock is resource intensive and the efficiency of public infrastructure is sensitive to underuse.
- Existing single-family homes have substantial capacities to adapt to changes in user requirements and are therefore resilient.
- As a material and cultural resources, single-family homes are of high value. Substantial degree of self-provision during renovation contributes to emotional attachment of owners to their property.
- Price rigidities, depreciation and vacancies affect the value of the property

In November 2016, a scenario process, addressing the 'futures' of detached homes in Germany until 2050, was initiated. Next to developing three to four scenario narratives, this process also helps promote interdisciplinary collaboration within the national consortium.

Networking and dissemination activities

Members of the national consortium have published three articles in peer-reviewed journals and are currently working on further manuscripts. Additionally, publications aimed at municipal actors and administrative stakeholders are being prepared. Shortly, a proposal for a special issue of an established scholarly journal will be submitted.

In addition to conducting research, the projects aims for international cooperation and promotion of future networking activities. Since 2015, several national and one international workshop were organised. International

partners provided insight on context specific challenges of their national single-family housing stocks and areas.

The conference in Mannheim, the results of which are published in this proceedings brochure, is part of the networking efforts. In November 2017, two more symposiums, an international scientific conference and a transfer conference for municipal and administrative stakeholders, will take place. The goal of networking activities is to provide contextual body of knowledge on single-family housing and to facilitate future research collaborations. So far, the exchange of research in different countries has shown that local factors affecting detached homes differ from one another, the composition of building stocks and the traditions of suburban ways of living are highly diverse. Despite the differences and the influence of local national specifics, researchers can apply similar methods to explore the dynamics of stock, users' and markets and furthermore engage in comparative research to provide insight on this specific, yet under researched part of the housing sector.

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The Single Family Home – No Longer a Superior Good?

Christine Whitehead, London School of Economics, United Kingdom

The Single Family Home – No Longer a Superior Good?

Christine Whitehead
Emeritus Professor in Housing Economics
London School of Economics

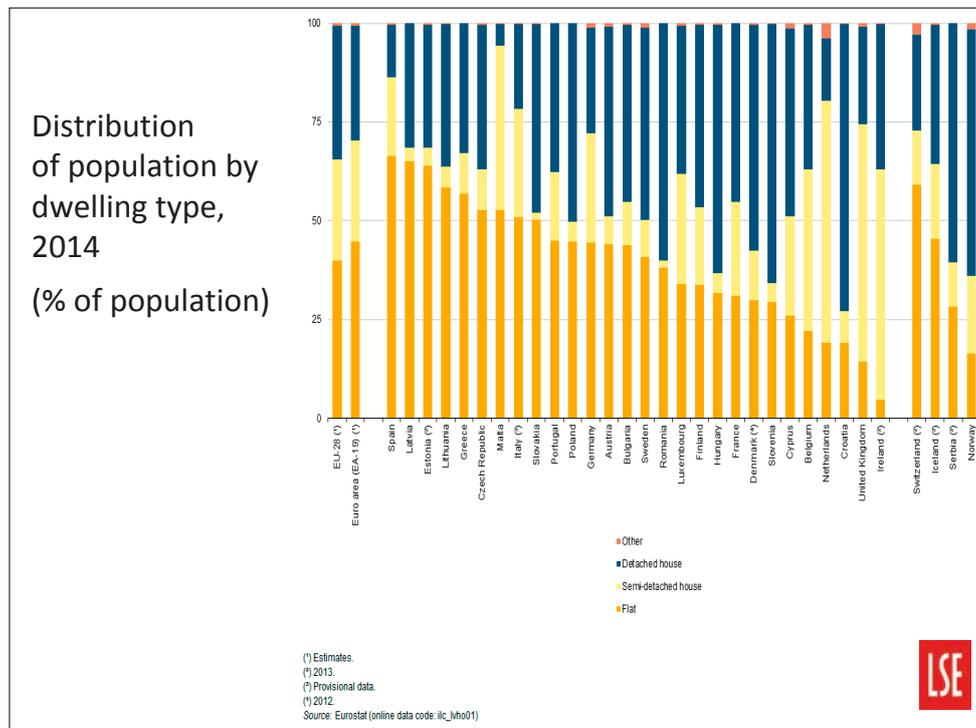
Homes-uP International Conference
ZEW Mannheim
October 13th – 14th 2016



The Single Family Home: Definitions and Attributes

- Surprisingly varied definitions – sometimes in terms of the household who lives there; more usually in terms of the dwelling. But within the dwelling stock definition can be similar to house, so including semi-detached and terraced homes as well as detached properties, or can simply include detached units;
- Attributes that have been seen as most desirable include: location – often in rural/higher quality suburban areas; wholly private space; control over the dwelling and its maintenance; no service charges; capacity to vary expenditure over lifetime; separation from neighbours; a garden; the potential for modifying the property to own tastes.
- Has traditionally been seen as the dwelling type to which home owners aspire. It also provides the easiest option for self and custom built new homes.
- However single family detached homes have been falling out of favour (at least in relative terms) over the last decades as relative costs and benefits change.





The Single Family Homes as a Superior Good

- In formal terms a superior good is one where the income elasticity is greater than 1 – so as incomes rise, a higher proportion of income is spent on that good.
- This was certainly true for certain types of single family homes, although that demand offset by subsequent price rises.
- Moreover, at least in the UK, the income elasticity of inside and outside space is similar, so gardens and low density development much in demand (especially bungalows).

Evidence required to test the hypothesis

- In order to show whether there has been a change would ideally want to clarify the proportion of income spent on SFHs by income group and over time;
- Relative price changes for different types of homes across different types of areas over time would also be valuable – and easier to obtain?
- Given that markets do not adjust fully could also look at quantity adjustments- vacancy rates and particularly the length of time vacant as compared to other types of properties in similar areas. Limiting case would be if evidence of dereliction or unmortgageable properties.
- Always problems of what must be held constant – notably local market conditions.



However

- Very large homes, particularly in rural areas, became less popular throughout the twentieth century and especially since 1945, in part because of household fission with generations less likely to live together; in part because less economic activity physically linked to the home; and especially because domestic support became less available.
- In urban areas such homes tended to be converted into multiple units or to be demolished and replaced by small blocks of flats both of which the market saw as having higher value.
- That process is still continuing with conversions from single family homes to multiple units more usual than the other way round and flats replacing homes (or gardens) especially near transport.



Major reasons for changing demands

- Increasing longevity;
- Reducing household size;
- Increasing relative costs of running the properties – notably energy;
- Ease (and cost) of access to services – tend to be car based;
- Lifestyle changes - fewer home based activities;
- Increased mobility - of household and extended families;
- A movement back to networking and city life?



Longevity

- Increasing longevity - average expectation of life in Germany and UK for those aged 60 is around 24 years – higher for women;
- Proportions of older households rising rapidly in most countries – Germany had the highest proportion over 65 in 2010 at 20.7% rising to 29% by 2030;
- Over 40% of women aged 65 plus live alone across Europe and three quarters of seniors living alone are women;
- Average disability free life expectation not much above 70%; at aged 65 life expectation free of disability is generally less than 10 years;
- By 65 the majority of people in Europe see their health as fair or bad – rising to over 75% by 85;
- All of these elements impact on the demand to live in single family homes but about particular attributes notably size age and location;
- More fundamentally: is control becoming less important as compared to access and support.



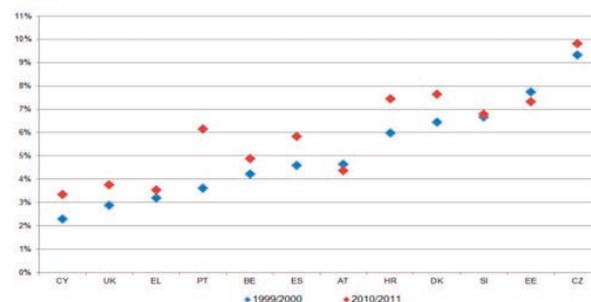
Relative costs of maintaining properties and well-being

- Types of structure; need for maintenance inside and out;
- Costs and complexity of buying maintenance services;
- Trade-off between control over timing and expenditure and the costs/problems of maintaining standards;
- Energy costs – while on average energy costs have fallen over the last decades much of the improvement is associated with smaller and newer units. Older single family homes tend to have low energy ratings;
- Lower energy ratings have direct impact on house prices;
- Again however often more about age and size of dwelling, garden and accessibility than specifically about single family home?



Energy costs as proportion of household income

Figure 79. Share of electricity, gas and other household fuels in households' disposable income



Source: Eurostat, Household Budget Survey (HBS) statistics



Accessibility

- Relatively large proportions of households living in single family homes are car dependent;
- Increasing transport costs and particular difficulties for older people;
- Services, notably health services, tend to be located in urban areas;
- Changing attitudes around climate change, public transport etc;
- The benefits of a walking distance society (Florida);
- Shifting views on urban versus suburban/rural lifestyle;
- Again more about location than inherently about the type of home.



Employment, Mobility and Lifestyle

- Twenty years ago the assumption was that people with choice and money would choose to live the rural idyll and work mainly on internet;
- In practice the importance of face to face contact, networking etc seems to have increased so the relative benefit of living in the city has led to movement back into urban areas and increased demand for apartments;
- In areas of high demand the costs of land preclude single family homes and lead to higher density higher rise living;
- Labour markets and lifestyle have also changed, resulting in greater mobility and longer periods in adult life before 'settling down' – so benefits of single family home start later;
- Growing importance of the 'sharing economy' – also urban based;
- Again more about access and proximity – but affordability tends to exclude the detached single family property – although not necessarily the terraced house.



Tenure

- The single family home tends to be owner-occupied. The integration of ownership and occupation, the clear identification of responsibilities and control over the property and other attributes make it relatively easy to mortgage and to match expenditures to lifetime earnings;
- These benefits remain important and may indeed have increased in value, in the face of uncertainty about future costs and improved capacity to realise part of equity to pay for consumption in later life.
- Even so, in many European countries renting is becoming increasingly important - linked to mobility, lifestyle and location factors as well as worsening affordability and increasing difficulties in accessing owner-occupation.



Costs of moving

- The most obvious response to these changing pressures might be to move home more often in line with changing demands – which would imply a single family home for maybe twenty to thirty years through child rearing (plus child returning) and moving to more suitable accommodation in retirement;
- If moving was a free good in both financial and emotional terms this might indeed be the pattern (as it is with some very high income households);
- However, transactions costs are high and people tend to move less as they get older.
- Importantly the costs of high quality, urban, accessible housing tend to be higher than the price achievable for a relatively run down single family home – one reason why so many older people now live in unsuitable single family homes
- Perhaps the next generation does not want to follow the same pathway.



Conclusions: looking to the future

- Many of the attributes of single family homes remain highly desirable;
- However other attributes of much of the single family home stock notably size and type of building and location are less suited to the twenty first century and particularly to older households;
- Equally lifestyle opportunities and types of employment tend to increase the demand for more accessible higher density living;
- Thus it is unlikely that even if real incomes rise, the demand for traditional detached family homes will expand relative to other options;
- However these arguments may apply less to terraced houses and other types of single family homes, especially those in more accessible locations;
- Much of this discussion is about the capacity to adjust – so increasing density and converting larger dwellings may be more economic;
- So homes that are difficult to transform into more suitable accommodation will have lower value;
- But some single family homes that provide superior attributes which are difficult to replicate will undoubtedly buck the trend;
- And other factors can change which might reverse some of these trends.



Session 1:

Cultural and structural classification

Tuning Residential Subdivision Rhythms

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Introduction

Since the sixties, Flanders suburbanized at a high pace, supported by a housing policy focusing on private homeownership and the construction of single-family houses through private initiatives (Van Herck & Avermaete 2006). Subdivisions of free-standing single family houses popped up everywhere and became the symbol of the post war success of the middle class. Still today, this is one of the most preferred mode of living for the majority of Flemish, providing social status and (part of the) identity to its residents (Dedecker 2013). However, this mode of urbanization is facing a number of significant challenges. The first challenge is ecological: the ecological footprint of residential subdivisions is too big. They are land and energy consuming. The second challenge is social. Residential subdivisions become increasingly socially and culturally differentiated, comparable with what happened in Flemish cities during the seventies and eighties, leading to comparable social tensions. The third challenge is economic. Flanders is heading for a real estate crisis (Vermeulen & Martens 2015). The land supply is much greater than the demand for land. This means that many land owners will not be able to sell their property unless it is well located, has an exceptional quality or is very cheap. Unfortunately, this doesn't count for many residential subdivisions. Our hypothesis is that the residential subdivision has to reinvent itself into a more diverse environment to respond to these three-folded challenges. This doesn't mean that the allotment should radically urbanize or ruralize. The answers will have to match the housing preferences of its residents and will therefore differ from those of the city or countryside. The aim of this paper is to give some clues on how these subdivisions may evolve.

According to Meeus & De Decker (2013) the success of the suburban residential model is largely based on the desire to continue living close to the homestead or in an environment that feels familiar. Their research show that once the (single-family) home is built or purchased, one will, when the living needs change, rather decide to adapt the dwelling or to commute

than to move. Therefore, they argue it is easier to strengthen the suburban model, to refine and supplement it, than to radically change course (Meeus & De Decker 2013). This regeneration is not just about building and remodeling, it will need to seek bond with the identity that residents give to their neighbourhood. This identity is (next to status) defined by daily tasks and routines that consist of regular walking, transport, living, shopping and working patterns. The French sociologist Henri Lefebvre (2004) speaks in this context of everyday rhythms that characterize the space we live in. Lefebvre declares that *"depending on the case, interventions are made, or should be made, through rhythms, without brutality"*. These interventions demand for a collaborative process, as he adds that for change to occur, *"a social group, a class or a caste must intervene by imprinting a rhythm on an era, be it through force or in an insinuating manner"* (2004). This paper discusses a research project in which such a collaborative process is initiated in a residential subdivision in Heusden-Zolder, Belgium. The aim of the project is to analyze whether such a process could lead to practices that can transform the subdivision into a more diverse living environment in order to address the three challenges listed earlier, while at the same time respecting the housing preference of its residents. Together with local and regional actors we investigate new alliances and new arrangements to connect local aspirations with greater societal ambitions and to probe into alternative models of ownership, use and management. As such we explore light, temporary and selective practices, attuned to the rhythm of the residential subdivision at hand.

This paper will first explore the context of the case study and the method used to initiate the collaborative process. Then we will theoretically explore Lefebvre's rhythm analysis to give insights in what constructs everyday rhythms in the case study. Subsequently, we will describe the collaborative process itself and discuss a number of 'rhythm' scenarios that were generated throughout this process. Finally, we will discuss a number of strategies to implement these scenarios and start the transition towards a more diverse neighbourhood.



Fig 4: Case study (source: Bernakiewitz)

Changes and Challenges of a Flemish Residential Subdivision

The residential subdivision in Heusden-Zolder, a small city in Flanders, is located near the historic center, with a school and supermarket in walking distance. When we walk through this quiet neighbourhood we notice single family houses with gardens in different architectural styles. Here and there an open plot waiting for development, is temporary used to grow crops or stall pony's. Since the seventies this neighbourhood underwent significant changes that increasingly generate a series of challenges.

The first challenge is infrastructural. The housing stock is not adapted to contemporary ecological demands, such as more durable systems of energy, heating and (waste)water management. As such, it becomes ever more costly to convert this stock to contemporary standards. As a consequence, these houses tend to perform bad on the housing market. The second challenge stems from demographic changes: How can this mo-

notonous neighbourhood mainly built by and for young families correspond to an increasingly socially and culturally differentiated population. While in the end of the eighties inhabitants were mainly under forty, since 2010 the population is simultaneously aging and rejuvenating (figure 5). Relocation movements (figure 6) confirm the trend of first home builders that move out and younger people buying up their homes. Another trend is that these second generation of inhabitants tend to stay less long in their homes. As well, these new inhabitants have more and more diverse cultural backgrounds. All these trends make for an increasing diversity in lifestyles, aspirations and needs which tend to evoke misunderstandings and tensions.

The third challenge is caused by the complicated and nontransparent building regulations. Over a period of two decades, the neighbourhood grew by means of big parcels being subdivided step by step. Agricultural land was subdivided and roads were built on former field tracks and parcel boundaries, mainly during the seventies. This incremental development led to dozens of

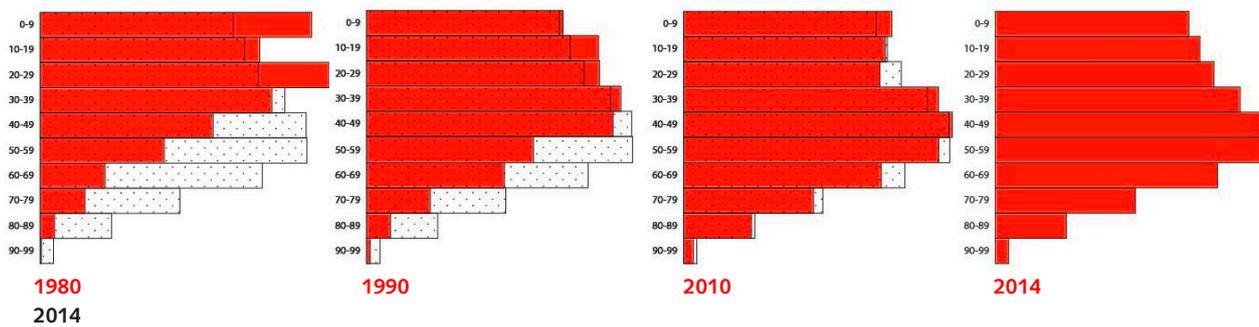


Fig 5: Age distribution in the subdivision, Zolder (source: Civil Services Heusden-Zolder)

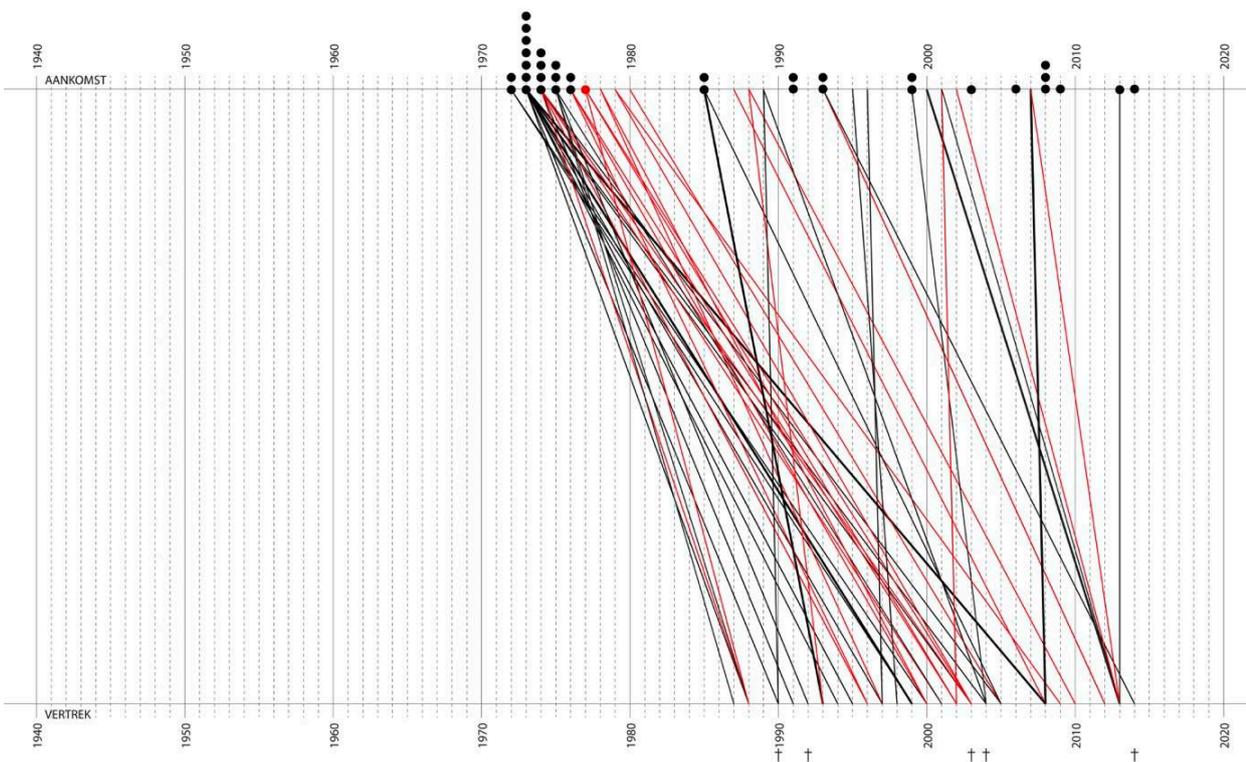


Fig 6: Relocation movements Langeweg, Zolder (source: Civil Services Heusden-Zolder)

allotment regulations, one per subdivided parcel, overlapping with two land use plans. In some cases it is not clear which regulation is prior, in others, neighbours do not have the same building rights. Moreover, according to the spatial planning department of Zolder these regulations provide few opportunities for alternative types of housing, functions or landscape interventions. For these reasons, the planning department started the procedure to revise the complicated regulations and develop one set of building rules that apply to all. At the same time, this procedure is seen as opportunity to densify the neighbourhood (from 8 to 20 houses per hectare) and to address the above challenges by leaving room for a more diverse use and development of the subdivision.

The Collaborative Process of Introducing Change

When a planning department decides to start a procedure to revise building regulations, it is obliged to also start a participatory process in order to involve the residents in this revision. All too often such a participatory process remains stuck in procedures, reducing the citizen involvement to a formality (De Bie et al. 2012). But, because the three spatial challenges cannot only be considered from a 'technical perspective or expertise' alone (De Certeau 1984), and because space is essentially about diverging opinions and viewpoints (De Bie & De Visscher 2008), we could convince the

planning department to experiment with a more open participatory process in the residential subdivision. This allowed us to start up a collaborative process with residents, local NGO's and local authorities, as suggested by Lefebvre (see introduction). Throughout this process the researcher (and main author of this paper) takes an independent role working in close dialogue with all involved actors to gradually build up a shared vision for the future of their neighbourhood; a future that addresses the three challenges and respects the dominant housing preference. This vision should finally be translated into new building regulations.

To meet this ambition, we set up an open and collaborative process with the following goals: (1) to MAP the social-spatial evolution of the neighbourhood in order to gain insight in the diversity of visions, needs and aspirations of all actors involved; (2) to CONNECT this diversity of opinions, needs and aspirations in order to build future scenarios, and to (3) to ACT in order to trigger a productive dialogue on these scenarios. Collaborative mapping plays a central role throughout the entire process, to communicate and to document the process, as well as to trigger dialogue.

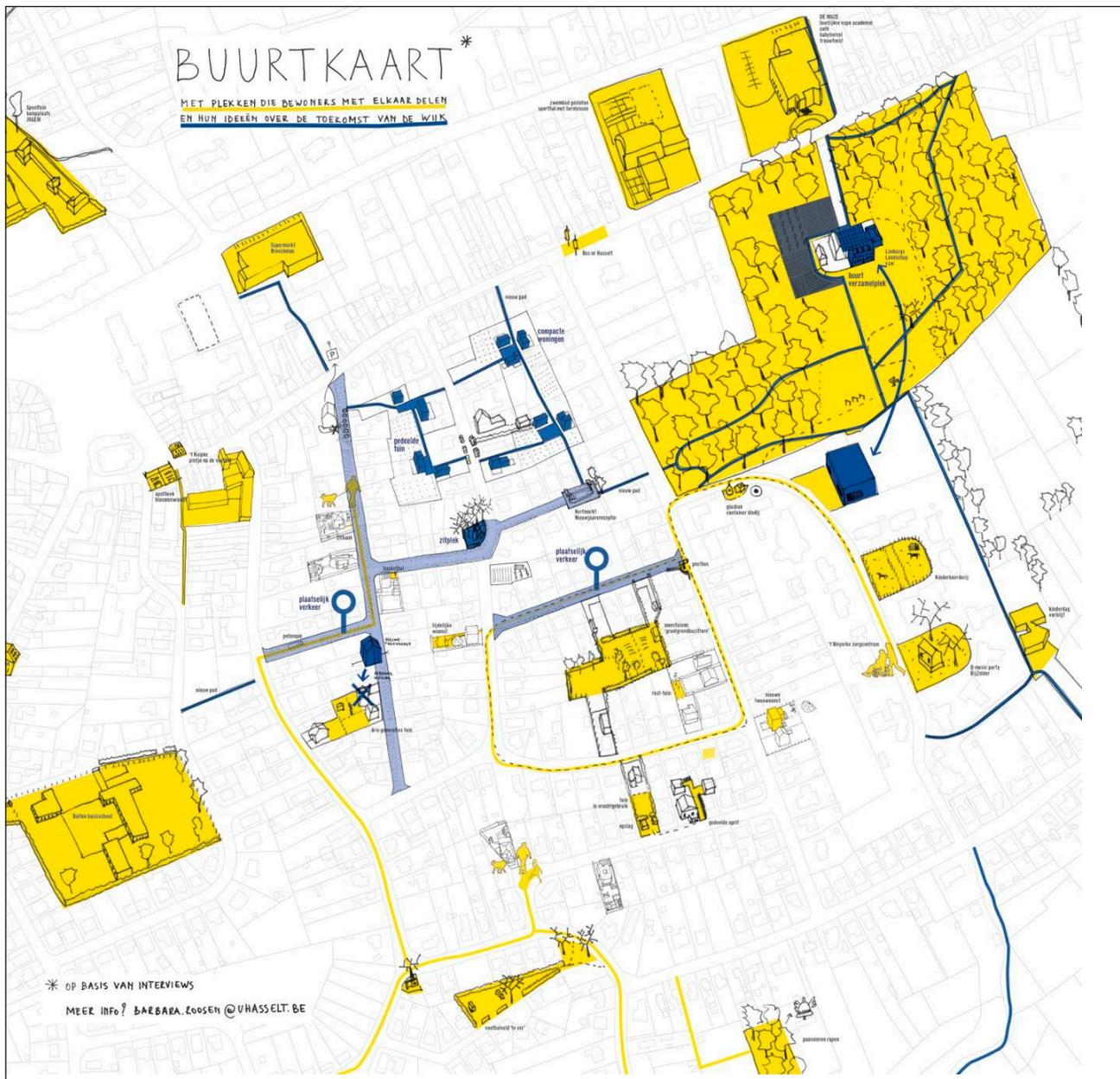


Fig 7: Collaborative neighbourhood map (source: Roosen)

The MAPPING started with the researcher analyzing demographic data, historic maps, and policy documents. Next she did a series of observations in the neighbourhood. In parallel, she conducted interviews with inhabitants, local organizations and authorities. Participants were asked about the use of their home, garden and the neighbourhood as well as their daily routines; both concerning the present and how they changed over time. Added up, these mappings gave insights into their needs and aspirations concerning their home and the neighbourhood. All data was documented on a 'collaborative neighbourhood map' as a way to pass stories and insights to the next conversation (figure 6).

To meet the second ambition TO CONNECT the researcher organized a series of workshops with small groups of residents mixed with designers, local officials or organizations. These workshops, which were called 'overlegcafés' built upon ideas that were generated during the interviews. These ideas were visualized on a large collage which became the subject of debate in the workshops. In a first phase participants reflected on these future ideas and built future scenarios on the collage. The results of the workshops were on the collaborative neighbourhood map to find connections between the different scenario's and the original ideas. In a second phase, the participants had to reflect over how they could initiate these futures and had to set an action plan with a concrete timeline. All groups decided to begin with an action that could support a dialogue with a bigger audience in the neighbourhood over the proposed future scenarios.

This brings us to the next steps of this collaborative process (to ACT) where we aim to test the output of the workshops according to the principles of 'design by doing'. Greenbaum & Kyng (1991) see "*doing as a central concept for active involvement of users and designers working together at activities (...) learners shouldn't be spectators or passive participants in the learning process.*" In other words, the idea is to organize a series of collective actions and experiments that will allow participants to experience and gradually explore the impact of the proposed future scenario's on their everyday rhythms. And as such, to finally build a future vision that can address the above explained challenges, and that all actors are willing to go for. This is not evident as this future will require that the neighbourhood has a greater diversity of housing types, program, facilities and landscape. This means that the area

will look different and will be used by other actors, in other roles and relationships, as such having an impact on the current everyday rhythms.

Residential Subdivision Rhythms

Lefebvre's concept of rhythm analysis starts from the notion that places are in constant evolution, shaped by repetition of a multitude of movements and actions that possess "*particular rhythmic qualities whether steady, intermittent, volatile or surging*" (Edensor 2009). In everyday life, Edensor (2009) presumes that familiarity and predictability originates from multiple habits, schedules and routines that organizes our lives. He argues that familiar places tend to be or become 'unquestioned settings for daily tasks' and accepted 'as the way things are'. And whenever change occur people tend to associate it easily with discomfort and nuisance. Lefebvre (2004) makes the distinction between normative and counter rhythms to depict, and sense a place.

The multitude of routineous practices that people follow happen often synchronic: everyone does more or less the same thing at the same moment, but mostly on their own. There where individual paths cross, arise geographies of communality within which social activities are co-coordinated and synchronized (Edensor 2009). Together they form collective choreographies of congregation, interaction, rest and relaxation, what Seamon (1980) calls 'place ballets'. As such these rhythms give insight in the way a place is used and how this use bestows it identity. So if we interfere in rhythms, we (often) intervene in space. And the other way round. Lefebvre distinguishes two key elements that help to understand the impact of this interference. Firstly, he argues "*no rhythm without Measure, without repetition in time and space, without reprises, without returns*" (2004). Consider the hour schedules, transport systems and arrangements we make with others about when, where and how to organize our daily life. But also the opening and closing of shops, the flow of postal deliveries and arrangements (rules) about how we (collectively) manage and use a space.

When groups of people agree to create new arrangements or refuse or break existing ones, they disturb and recompose everyday rhythms (Lefebvre 2004). Consider a school opening its door for sports activities in the evening. Or two neighbours deciding to share the back end of their garden. This brings us to the second key element, namely Alliances. The introduction of new

alliances can introduce some degree of harmony between rhythms, while breaking harmony between others.

In what follows, we reconstruct the Measures of and Alliances between everyday rhythms in the residential subdivision in Heusden-Zolder. This reconstruction is based on a series of interviews and mapping sessions.

Everyday rhythms

Inhabitants describe their neighbourhood as calm. Even too calm for some. This stems from the monotony, stability and slowness of its choreography. Consider a group of children walking to school in the morning, people stepping in their car on their way to work, a man walking his dog and the postman on his scooter doing his round. These everyday rhythms seem to pass slow, because of the small amount of people and activities. But also because they happen merely individual and parallel with rare moments of interaction and congregation. This rhythm is consolidated in the spatial layout of the residential subdivision. For instance, there is hardly any 'public' space. The only public domain, the street, plays a minor role in social life. Moreover, it is sometimes seen as a source of annoyance.

Considering playing on the street is dangerous and an unknown hiker suspicious. In the seventies and eighties, when the majority of the settlers were young families, residents met more regularly. Now that some moved and new young families moved in, the diversity increased, paths cross less and social life is less synchronized. Life in the subdivision takes place behind curtains, hedges and fences. Everyday rhythms are orientated towards private life and are capsular. Residents do meet, but on private property. For example, for hobbies such as the restoration old-timers or antique furniture, or gardening. But only by invitation, and preferably not every week. Although the choreography changed over the years, it remained slow, monotonous and capsular. The question is how to speed up these everyday rhythms, make them more diverse and less capsular without resolving to an urban rhythm? Because then residents will opt out.

Measure

Residential subdivision rhythms are determined by the measure of building regulations and rules. These rules are infrastructural and constitute a connection between built structures, land structures and their use. According to Lehnerer (2009) they describe processes and are not mere passive forms of description but instead also

active steering elements for future development. Ben-Joseph (2005) points at their persistent effects, because they are hard to change once adopted. Some of these effects are unintended. Ben-Joseph points for instance at the sprawl inducing nature of subdivision codes: the inflexible design standards on street widths, lot sizes, setbacks and open space promote excessive land consumption and impervious surface.

In the case study of Zolder, building regulations only permit single or two family homes. Only limited added program (like a small shop or workshop) is permitted when it is discrete and doesn't disturb the neighbours. Small scale renovations and extensions, the splitting of plots and the insertion of semi-detached houses and apartments do bring about change and densification. However, the spatial quality and durability of these mutations are questionable. The regulations are so strict that the changes hardly generate any 'noise'. The rhythm remains uniform. But beyond these formal rules, residents are still creative.

Consider a plumber warehouse or car workshop in an (oversized) garage. Or a young couple that constructed a wooden holiday bungalow in the backyard as temporal home during the construction of their house. Once moved, his sister moved into the bungalow.

Or a car mechanic that occupies the road verge and front garden to sell second hand cars (figure 8). And

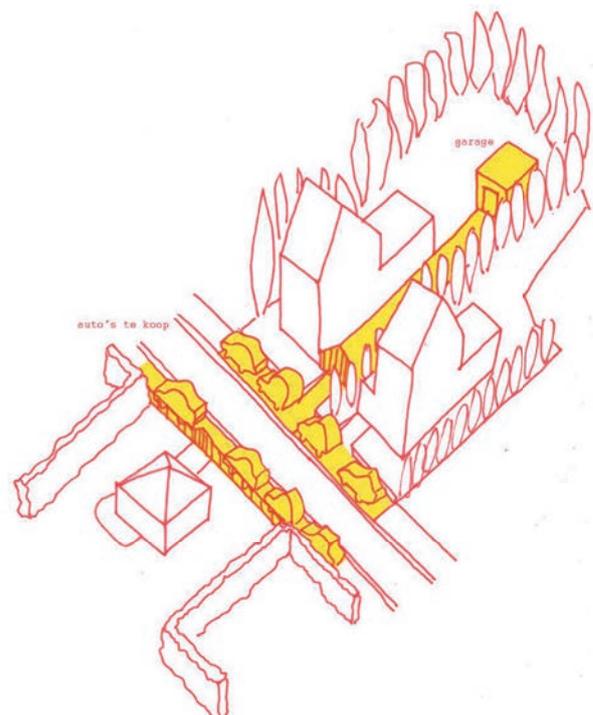


Fig 8: Sketch street use of car mechanic (source: Roosen)

inhabitants that leave their front hedges grow too high to be able to use the front garden as private terrace.

These examples make clear that capsular rhythms can be quite diverse, in spite of the precise and unambiguous formulation of the regulations, producing a multiplicity of alternative realities (Lehnerer 2009). According to Lehnerer rules should define 'degrees of freedom' that leave room for negotiation. In contrast to his plea for 'open' standardized rules Ben-Joseph (2005), on the other hand, urges for place-based but flexible building codes, supervised by a local planning authority. Both approaches to building regulations can be used to diversify the Measure of a residential subdivision, as long as they fit in a larger spatial vision.

Alliances

"Rules themselves are not productive, those who adhere to them are" (Lehnerer 2009). Residential subdivisions are characterized by a fragmented ownership structure counting a large amount of private home owners. Public actors are often restricted to the municipality that maintains the public infrastructure. 'Bigger' stakeholders like a social housing company, a big enterprise or a social organization that can initiate a project and as such introduce a new rhythm, are scarce. In short, the big amount of small and similar private stakeholders makes it difficult to get things done.

Similarly, alliances in the residential subdivision in Zolder are small and mainly concentrated in the private sphere between two neighbours, between family members or between parents whose children attend the same class. We refer to them as micro-alliances. In Zolder we observed that these alliances make social arrangements about the use and maintenance of their parcels. For instance, two neighbours made a written agreement to share their driveway. The owner of the plumbing company turns his van on the lot of his neighbour. In return this neighbour can turn his driveway into a garden (figure 9).

In another street block three neighbours decided to buy and divide the communal playground in their backyards and turn it into an allotment garden. For two decades they garden together. In recent years, gardening became less and the hedges grew. Still they go to the backyard for a regular chat.

In a dead end street neighbours made openings in their hedges and allow each other to pass through their gardens to go to the local park (figure 10).

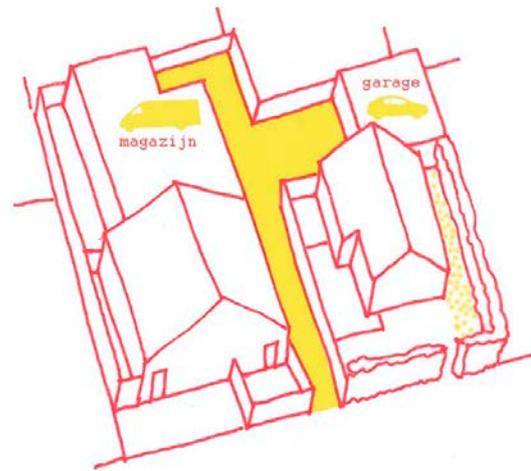


Fig 9: Sketch shared of shared drive (source: Roosen)

These alliances are very light and often temporary, as long as both parties need to. But they are important in the everyday lives of the residents. They do have some resemblance with the governance of commons, which always contains a social agreement (Ostrom 2003). And just like commons, micro-alliances dissolve often when there is no more utility for its users. In other words, when the balance between contributing and receiving is gone. De Moor (2015) describes commons as an historical form of an institution for collective action, formed by direct stakeholders that collectively agree upon group norms. These norms define access rights, excluding 'others'. These features should be kept in mind when experimenting with new alliances to obtain a more diverse neighbourhood.

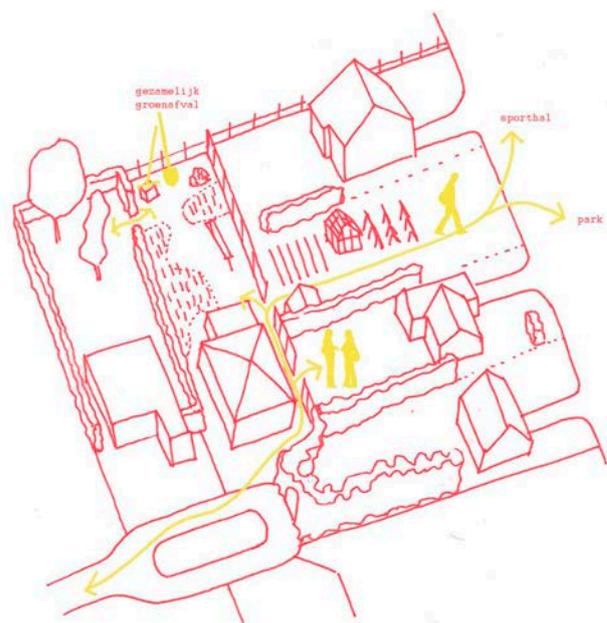


Fig 10: Sketch passage through private gardens (source: Roosen)

To conclude, even though the building regulations support slow, monotonous and capsular everyday rhythms, the mapping of spatial behavior show that these regulations allow for slight and temporal 'aberrations'. So if the regulations allow for the introduction of diversity, and thus the addressing of the three challenges, what is then the problem. The aberrations are too small in number, too isolated and not always qualitative. As such, they may even increase, rather than address the three challenges. The question is how to allow for and even amplify these aberrations, while at the same time guaranteeing spatial quality and preventing negative conflicts.

Tuning Residential Subdivision Rhythms

The workshops generated three future scenarios for the residential neighbourhood. All three were triggered by ideas generated during the interviews: a shared street, a shared garden, a neighbourhood facility node. These scenarios are not particularly novel. What is novel is that they are being developed collaboratively by groups of actors directly involved in the subdivision, be it residents, local authorities or organizations.

Shared streets (woonerf)

What if the street would be car-free for a period of time and would turn into a shared street (Ben-Joseph 1995), open to use by all its residents? Today, the prominent role of the car in the street prevents residents from using

the street to play or meet. The workshop makes clear that the participants see great potential in allowing only local traffic in order to revitalize social life. They imagine the street and verge to become one zone for walking, playing and local slow traffic. To convince more inhabitants in the street, they propose to measure the degree and speed of through-traffic and decide to organize a small festival during summer. With this event they hope to initiate a dialogue with more inhabitants about alternative street design, traffic regulations and maintenance of the street. In the long run, they hope to inspire other streets to do the same, as such building up a local network of soft tracks and shared parking that offer alternatives to short car drives and connect different neighbourhoods and different social facilities. This network will not only bring in diversity in the street pattern but will also give stage to new place ballets (Seamon 1980). People meet, whether or not by accident, where trajectories cross or overlap. A local network could, for instance, activate a chapel in the neighbourhood as a node with space for hikers and cyclists to hang out or play on their way to school or to the adjacent park.

Although street life maybe becomes more diverse, it remains capsular as it is mainly used by those residents living in the street. As such, the changes have a minimal impact on the calm and slow nature of the neighbourhood. What does changes is that it involves more than two neighbours who will have to agree upon the use



Fig 11: Workshop 23/03/2016 (photo: Roosen)

of their street. They will have to negotiate upon where to park and when and where the street will be closed for traffic. At the same more diverse and capsular street use will result in more diverse modes of street management. During the workshop, a local nature organization expressed interest in the maintenance of the greenery around the chapel, as it is a way to conserve the historical cultural landscape.

Shared gardens

What if you are allowed to build in oversized or underused backyards? So that the elderly can stay in the neighbourhood, while their larger homes can attract young families. The neighbourhood counts many elderly. Most of them prefer to stay in their home as long as possible. But for many the house and garden becomes just too big to maintain. This is one of the reasons why inhabitants think about alternatives. But current regulation doesn't leave them many options, only allowing for the reconversion of their house into two-family homes under strict conditions. During the workshop participants explore the potential of developing their gardens collectively. They agree that it can allocate multiple uses to the inner garden, such as (semi-public) soft tracks or local water treatment. Additionally, it opens up possibilities for new housing types and clustered care facilities, that, in the long term can replace some of the underused villa's. To achieve such a collective development, the participants conclude that they need to experiment with Measures and Alliances that disconnect use from ownership. For example applying transfer of development rights on the scale of a large street block. Or applying alternative ownership models such as cooperatives, building groups (Baugruppen) or Community-Land-Trusts to the context of an existing residential subdivision, with new and original land owners.

Introducing such novelties in the context of fragmented ownership structure with many landowners who do not have the experience to negotiate and collaborate with others when it concerns their land, is challenging. To explore these challenges the workshop participants decide to start up a dialogue with all of the land owners about the future of their own parcel. This dialogue will take the shape of a series of collective consultations with architects during which residents explore the synchronization of personal and collective benefits. The final aim is to trigger new alliance between inhabitants to collaboratively develop building guidelines or maintenance schemes for their street block.

A neighbourhood facility node

What if a local park becomes a neighbourhood node for projects concerning gardening, local food and the processing of green waste. This is the shared idea of a local health institution ('t Weyerke) and a nature organization (Limburgs Landschap vzw) adjacent to the residential subdivision to respond to the recent trend of facilities (a cultural center and sports center) to move out of the area. The park is part of an historical site with a mansion. The mansion is owned by the nature organization, the park is communal property and plays an important role in the everyday life of the neighbourhood. Inhabitants use it to pass through, to walk their dog, to run, fitness and picnic. The nature organization would like to open up their mansion to the neighbourhood with a local restaurant, offering meals served by the health institute, and meeting rooms for local organizations. During the interviews, many inhabitants favored this idea. Especially elderly see it as a new meeting place. During the workshop participants formulate the idea to add a neighbourhood allotment garden in the park. Gardening makes part of the health program of 't Weyerke. If accessible to wheelchair patients, they are happy to take care of the maintenance. If this experiment works, the mansion could also house a sporadic local market or shop for food products from the gardens. And 't Weyerke can decide to extend their green waste collection by patients to the entire neighbourhood. All these ideas thicken the park as a node for 'light' facilities, taking into account the slowness and low demand in the residential subdivisions. And also in this scenario, new alliances introduce a new beat in the residential rhythm.

At the end of the workshop, the participants decide to organize a public debate in order to develop the maintenance plan for the entire park. This debate will be set up as a big picnic event in the park.

Towards Rhythm Strategies

If we follow the logic of the three rhythm scenarios then durable transformation into a more diverse living environment will start off thanks to a multitude of small projects and actions, rather than through one large development project. Light or temporal interventions that gradually or by reproduction get more impact and more scale in the neighbourhood. The rhythm scenarios therefore don't require a master plan from the start. A shared local vision can grow little by little, during the process, out of the shared experience of these light in-

terventions (and the dialogue that they produce). In time, this vision can be formalized in a spatial implementation plan or maintenance plan, when the opportunity presents itself.

Inherent to the discussed rhythm scenarios is that they are created by new alliances. Alliances between two neighbours, between a group of inhabitants with similar needs or aspirations, but also with new regional actors such as a farmer, ecological organization or a care facility. These interdisciplinary alliances allow local and individual ambitions to intertwine with wider ecologic, social and economic challenges. Because the vast majority of land in the residential subdivision is privately owned, these alliances will allow for semi-public, selective use, with restricted access. And they will last as long as users or partners experience sufficient personal benefit. Therefore, these alliances acquire adapted measures and norms for collective use and shared management. Consider the maintenance of a communal allotment garden by a health institute (Scenario 2). Or a street that agrees upon traffic and parking regulations in their street.

Out of these temporal, selective and light projects will emerge novel everyday rhythms. With different movement patterns, that change the way inhabitants meet. With other activities and facilities that are clustered to meet the low demand typical of the residential subdivision. All together, these altered rhythms will increase the diversity of the residential subdivision, but without radically change its course.

As a final note, most inhabitants of a residential subdivision do not want anything to change. They live their housing dream. The collaborative process therefore not only takes time, to let these residents experience that alternative futures may also comply with their housing dream. The process will also face a lot of resistance, of residents that do not want to join in, of residents that will even obstruct the process. But time will prove them wrong, because the impact of the three challenges will only increase.

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Utilisation of single-family homes in a suburban context – A multi-temporal approach applied to the city-region of Karlsruhe

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Introduction

Single-family homes receive reinforced attention. Demographic and sociocultural changes affect the utilisation of single-family homes, which – after decades of growth – today form an established and aging part of the building stock in suburban city-regions. As such, they are subject to adaptations and renewal due to changing demand (Siedentop 2014). In Germany, single-family home markets shows diverse pictures of shrinking occupancy rates and oversupply or high demand and intensification of use (Berndgen-Kaiser et al. 2014). To understand these patterns and dynamics of transition – also in order to consider intervention from planning – the spatial and functional context becomes important. Due to suburbanisation, which means the urban expansion and de-densification of residential and economic activities, polycentric city-regions with multiple functional interlinkages form this context (Keil 2013; Reicher & Hesse 2014).

In order to analyse heterogeneous processes that affect the utilisation of single-family homes in a city-regional context, challenges arise. Effects on a suburban (regional) level, e.g. by the regional labour market, or a shrinking population determine the development opportunities of an ageing building stock. Also, site-specific, local conditions need to be observed in order to describe the utilisation and to allow for an effective discussion on adaptation measures. However, in countries like Germany, along with splintered administrative responsibilities, also data provision for such a two-level analysis becomes difficult. The first challenge is the limited access to geographic data on building stocks and processes for a consistent, suburban area. Also, consistent, small-scale historical demographic data to measure the utilisation of building stocks is not available. Hence, the need to analyse single-family homes from a suburban perspective makes data limitations obvious.

As a result, we lack an understanding of heterogeneous processes within suburban city-regions. Therefore, an integrative methodology is suggested to link dynamics of housing stocks, site-specific conditions and popula-

tion in order to structure, analyse and assess the utilisation of single-family homes. This leads to the following research questions:

- Which approach allows for developing a consistent data basis for the analysis of single-family homes in a suburban context?
- Which processes and structures determine the utilisation of single-family homes?
- How can suburban districts be characterised in order to discuss adaptation strategies?

Method

The method integrates approaches to develop a consistent data model that includes building stock, population and accessibility (Jehling et al. 2016). Suburban single-family homes are part of a total building stock of a suburban city-region. Therefore, an automated approach to reconstruct the total historical building stock by means of an analysis of geospatial topographic vector data and historical topographic raster maps is used (Meinel et al. 2009). For the urban structure, building type information is obtained by automated classification. To estimate the age of the buildings, topographic map sheets are analysed in order to check the existence of a particular building footprint at a specific time. By this approach, individual buildings can be described by building type, age class and floor area. The utilisation of the housing stock becomes apparent through population structure and change. Hence, small-scale demographic data is required to link population to buildings (Berndgen-Kaiser et al. 2014). Historical data on population statistics on a sub-municipal level is only gathered and maintained by municipalities and, subsequently, needs to be collected individually. The acquisition and treatment of this data allows analysing the demographic structure on district level in a given year for the city-region in total. In order to consider locational aspects within the suburban context, the accessibility by means of transportation is integrated into the approach. We deploy an approach that takes into account the increasing polycentricism of city-regions

(Danielzyk et al. 2014) and measure the accessibility of each location within road and railway networks. To show dynamics, data is selected for three time steps to contrast the development of two time periods. Overall, this lays the basis for an indicator set to operationalise a conceptual model, which describes causes and effects for the utilisation of single-family homes in a suburban context.

Based on this model, underlying processes can be analysed. Therefore, an explorative factor analysis is applied to the two periods to detect causes that affect the usage and show changes of those. A subsequent cluster analysis structures the multiple, interfering effects on the districts and discerns suburban patterns for both periods. Finally, suburban structure types (Blum et al. 2010) condense information about a specific constellation of processes that determine the development opportunities for the housing stock (Jehling 2016). The method is applied to the city-region of Karlsruhe (standardized German nomenclature of functional regions), which consists of 50 municipalities and 180 sub-municipal districts, which serve as statistical unit. Therefore, data is gathered to analyse the periods from 1992-2002 and from 2002-2012.

Results

Applied to the case study, the methodology allows for analysing the spatial and temporal dynamics of the

building stock. For the construction of single-family homes (figure 12) regional trends such as suburbanisation can be shown in the two analysed periods: In the 1990s strong growth can be shown for an inner ring of districts surrounding the City of Karlsruhe. The construction loses dynamic in the 2000s and development is shifted to more peripheral areas. Underneath the municipal level, heterogeneous processes in the districts can be shown.

The utilisation of residential buildings is described by population dynamics in the districts. In contrasting the aging of the population within the two time periods, a general aging of the population become visible (figure 13). Further, in the 2000's a ring of districts with strong aging appears. The comparison with the building dynamics reveals that aging seems to occur there, where only limited construction has happened. Once more heterogeneous processes within municipalities become visible not only regarding the districts of the City of Karlsruhe, but also regarding peripheral districts.

Beyond these examples, multiple processes and their interference on district level need to be covered. Through factor analysis and cluster analysis, regional processes and patterns are discerned. As a result, suburban types are derived that show specific constellation of dynamics in population, housing stock and accessibility.

Figure 14 shows the districts by those types that describe dynamics in the utilisation of single-family

1992 - 2002

2002 - 2012

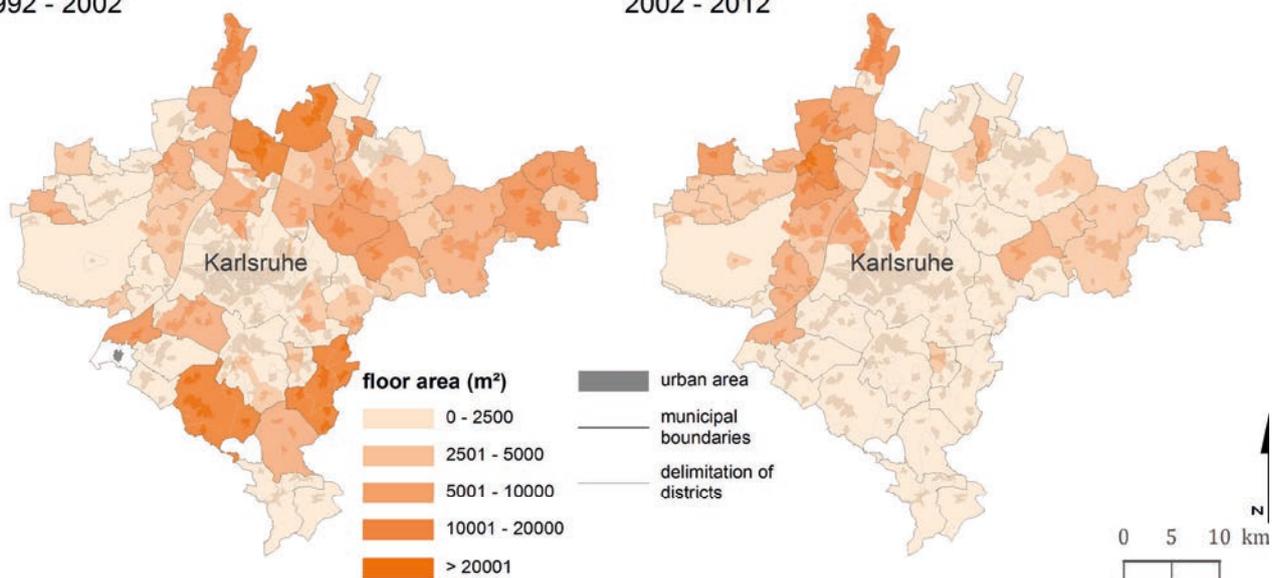


Fig 12: Dynamics in single-family home construction: newly constructed floor area within period (source: own calculation based on DLM250 © GeoBasis-DE/BKG 2016, ALKIS® © LGL-BW 2013, OpenStreetMap (CC-BY-SA); DLM250 © GeoBasis-DE/BKG 2016)

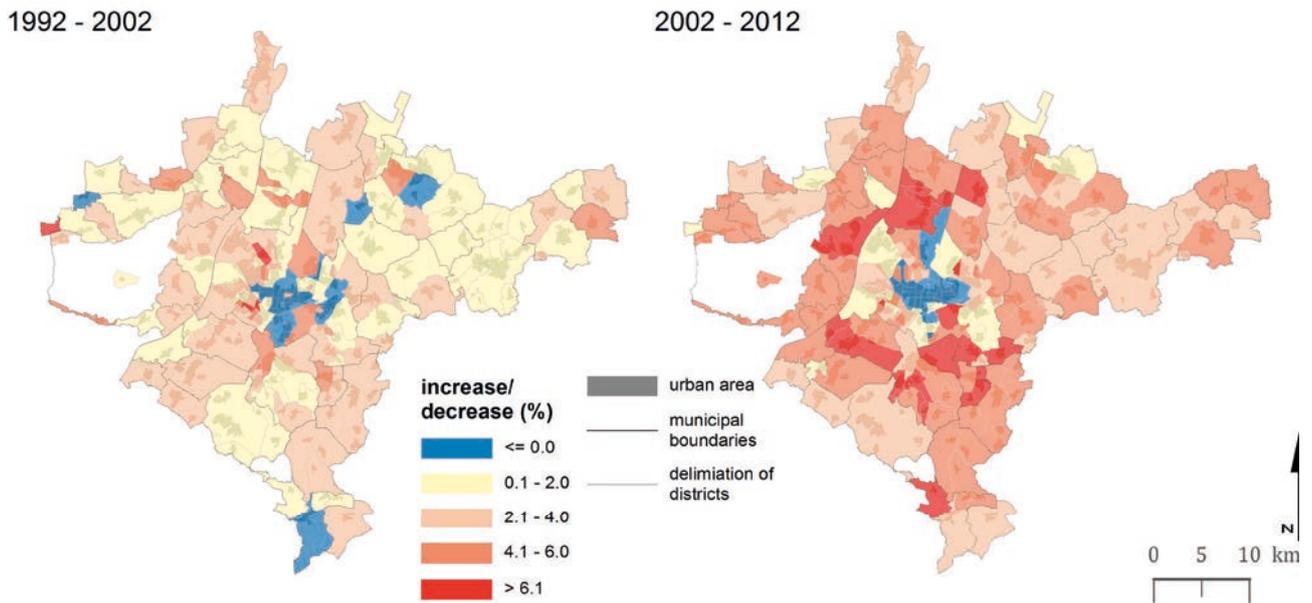


Fig 13: Dynamics in utilisation: changes of the share of elderly people (population older than 70 years) (source: own calculation based on DLM250 © GeoBasis-DE/BKG 2016, ALKIS® © LGL-BW 2013, OpenStreetMap (CC-BY-SA); DLM250 © Geo Basis-DE/BKG 2016))

homes. Hereby, subsequent phases can be identified: Districts with high shares of single-family homes show effects of long occupancy rates, which are typical for Germany. While aging households remain in their homes, the local population ages substantially (type 'ageing suburbia'). In-migration of younger population relies on the construction of new buildings (type 'new suburbia') or on self-sustained cyclical tenure change processes (type 'mature suburbia') (Berndgen-Kaiser et al. 2014). 'Mature suburbia' shows the importance

of a heterogeneous building stock with a considerable ratio of apartment housing for a balanced development. In some districts, aging is characteristic throughout the two periods. This can give hints on locational aspects, as lower demand might affect the reutilisation of the building stock. Beyond market mechanisms, the patterns also allow reflecting on suburban policies by which communities actively promote or thwart further development (Phelps & Wood 2011).

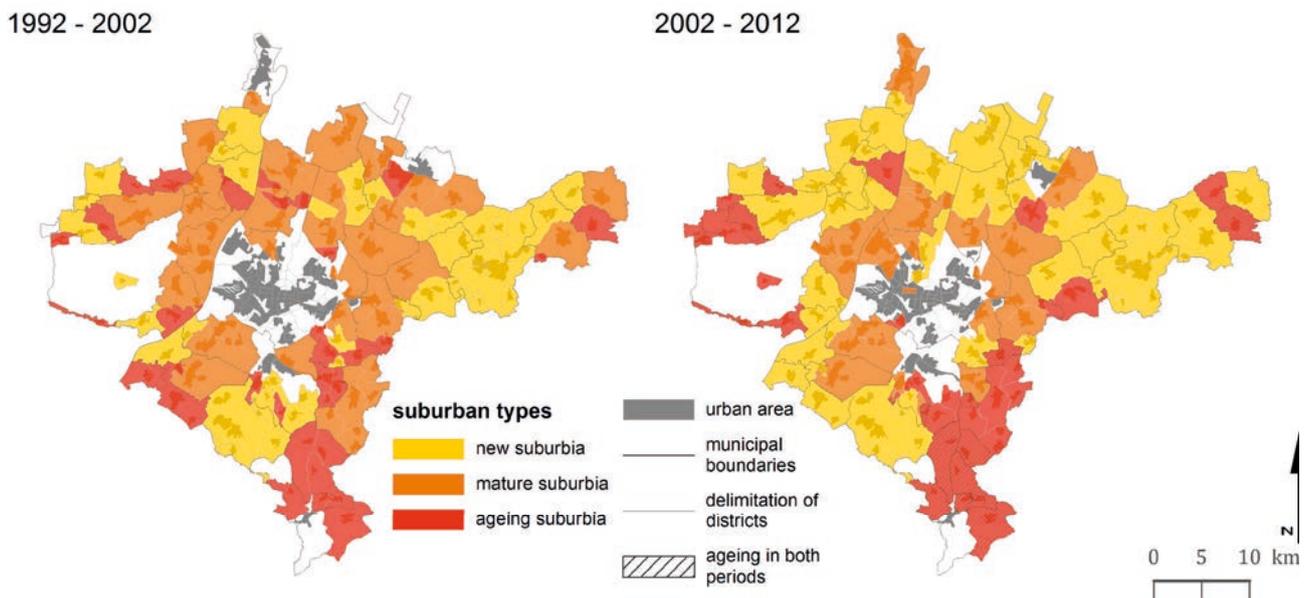


Fig 14: Suburban typology: structural types and transitions (source: own calculation based on DLM250 © GeoBasis-DE/BKG 2016, ALKIS® © LGL-BW 2013, OpenStreetMap (CC-BY-SA); DLM250 © GeoBasis-DE/BKG 2016)

In conclusion, the developed and applied approach can be used to link dynamics on suburban and local levels and describe the utilisation of single-family homes in a city-regional context. The classification enables a focussed discussion on potentials for interventions by urban or regional planning in order to adapt single-family homes to changing conditions.

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Session 2:

Sustainability and resources

Questioning the Single-Family Home

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Taking the single-family house and its objects as a focus, our projects investigate the exclusive use and the reuse of things. In doing so we integrate approaches from material culture studies and engineering material studies. In both fields of knowledge, the flow of things has attracted fresh attention: re-using things is no longer an issue which can analytically be categorized as secondary in comparison with a first or seemingly primary use, but is conceptualized as a rule and or even as an intention. In cultural anthropology a systematic study of the tension between exclusive and cumulative use of things is due. In waste management the German Kreislaufwirtschaftsgesetz (Waste Management and Product Recycling Act) of 2012 interprets the concept of 'waste' in a new way: potentially, now all things are resources in an ideally infinite cycle. Private consumption is terra incognita to this concept of circulation and in the meantime has become huge resource deposit. Our investigation is realized as cooperation between an ethnographic and an engineering approach in a three-year BMBF-project and thus combines analyses of the everyday culture and the materiality of the single-family house. The single-family house and its objects are exquisite technical as well as cultural material for an innovative investigation into the question how family operates as the most important transit point for objects and meanings in everyday life: here the change in ways of life (from the monolocal male-breadwinner and female home-maker family to the multilocal, unbound family, to duallearner families, to single-parent households etc.) and the ecological issue of resource conservation have caused far-reaching changes in the cultural and material-technical bases of life. The latest research has observed two tension-filled dimensions in this situation: on the one hand, changing ways of life collide with persistent ideals of nuclear family life in an eternal home loaded with hopes for the future, with home loans and with images of a good life; on the other hand regional and spatial planning as well as ecological resource management collide with these persistent everyday practices and values of bourgeois respectability, i.e.: playing house, everyone with their own garden, in suburban areas. This situation calls for

new cooperation between experts in the cultural analysis of symbols and meanings and those in the materiality of resources. We investigate three variants of the single-family home in north-west Germany, with empirical approaches from ethnography, building history and material analysis.

The single-family home is described as a phenomenon of Fordist regulation with the specific cultural imagination about the male breadwinner family materializing in this living type. This typical Fordist pattern of living has changed since the 1970s due to different social, political, cultural developments, e.g. a pluralization of familial living, more dual-earner couples with an increasing demand mobility and flexibility, changing concepts of childhood. However, the single-family home persisted in West Germany and emerged in East Germany after 1989 as a preferred building and living type for families.

Our contribution presents the first results of our project in comparative perspective. Our common focus is the topic of different aspects of (re-)use. First, we focus on the question of durability that has emerged in its material as well as in its socio-cultural dimension. Concerning the families' visions we asked for the ideas and sketches made for the future. Is durability an effective value orientation at all? How long do people want to live in their selfbuilt homes and why would they move out? In what way does the hope of children continuing the house collide with the personal biographies and what are the lived and imagined alternatives? By asking the residents about their plans, their imaginations and ideas for their future in the house we get to know their concepts of living in old age in a single-family home, their concept of a self-built house as being home to a family, and we get to know the strategies of making the home durable. One strategy is the architectural adaptation of the house, which is already prepared when planning the house. Documented in this is the idea that different periods in one's life have different needs. So in order to stay in the house it is necessary to change its architectural form. Another strategy is a vaguer belief in everything being steady. The house is planned for the current needs of a family and is intended to be passed

on to the children's family sometime. These results are combined with the findings based on the material analysis. This detailed analysis of the raw materials as well as the interior authorizes statements not only about the quantity of materials which are used in the single-family house, but about the durability and sustainability of the materials and the house. What resources and (raw) materials are used? What is the half-life-period of the materials used? The research design of the project permits statements not only about the social but also about the technical durability of a single-family home. We understand single-family homes and private households as urban mines. What kind of resources are the uninhabited SFH from the 1980s and what kind of urban mine is the newbuilt one? How to deal with the empty houses? What can strategies look like when taking the houses as urban mines into account?

Our second point in discussing re-use is to understand the relevance of building a house of one's own instead of buying a *second-hand property*. Based on our empirical data, it is possible to reconstruct the decision to build a new house. There are two figures of reasoning which are dominant in the narratives of the people talking about their private decision not to buy second-hand property. First there is the financial reasoning that building new is not more expensive than buying. It is not about saving time when buying a house, it is about not spending that much more. It is a kind of negative reasoning that legitimizes the decision. The second argumentation is about the idea that second-hand properties do not suit the needs of one's family. So people would have to rebuild the second-hand properties. The third reasoning is about the difference between buying a home and building one. This refers to the imagination of one's own home not only in the legal way of understanding. To call a house one's own it is not enough to have the title deed, but to have laid the foundations yourself. Based on our ethnographic data it is possible to reconstruct these needs. Thus our cooperative perspective on the materiality and the culture of the single-family home makes it possible to understand the paradox of building new houses where at the same time single-family homes lying empty.

The *methods* of data collection are different depending on the particular question of research. To answer the questions of family ideals, concepts and practices of living becoming evident while planning, building and living in a single-family home, we outline an ethnographic research design consisting of interviews (e.g.

with families living in SFH, political experts, architects, employees at the recycling depot), participating observation, and a 'home inspection,' meaning an accompanied walk-through.

The material analysis took place on three levels with three different approaches. The focus of the first level was on the building structure. Using the original construction drawings and invoices provided by the family, it was possible to calculate the amount of building materials used. The second level included the furniture in the building. An exact determination of the materials used and its amounts for all the furniture would involve an inordinate effort. So an approach was developed to estimate this. Based on approx. 1,300 datasets, diagrams of different kinds of furniture were created. Depending on the kind of furniture and its main material as well as its volume, it was possible to estimate the mass of pieces of furniture. For this it was only necessary to measure the furniture in the building. The third level focuses on the items in the building. This includes also electrical appliances. Consumables were not considered. The approach is similar to the procedure in level two. But in this case, for reasons of privacy, the inventory was drawn up by the house owners. The family was asked to count or weigh all the items in their house. As assistance they received instruction documents as well as a catalogue adapted to their house to be filled out. Besides the information on the kind of the objects and their quantity, the main material of the item was recorded. Using statistics and other datasets, the material composition of all the items in the building was estimated. Virtual single-family houses were created to arrange the results of this case study in order and place the resource studies on a broader footing at national level. Official statistics on the subject of living, for example on the possession of electronic devices, were used to create virtual homes in different income classes to show the ranges of resource consumption of single-family buildings. This integration of material and cultural analysis produces a comprehensive study of the phenomenon of single-family homes.*

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How “Green” or “Grey” Should Cities Be? Lessons from Residential Land Use Footprint of the Rich

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Urbanization is an ongoing process across the globe. Empirical evidence suggests that people worldwide, apart from those in very poor regions, “may all live in cities by the end of the century” (Batty 2011, 771). Over this same period we may also become considerably wealthier if historical trends continue (Clark 2007), in part because urbanization fosters processes that lead to wealth creation (Bettencourt & West 2010). Higher wealth, in turn, appears to correspond with higher appreciation of green spaces in residential areas (Anderson & West 2006; Brueckner, Thisse & Zenou 1999) – green space is in terms of land use, however, essentially the counterpart of urbanity. This poses an important question for urban planning in the aim to strike a balance between the advantages of the supply of green space and levels of urban density: as we grow wealthier over time, will we in future long for more green space in our increasingly urban living environment? And if so, should cities not be built in a greener way than is currently being done? Indeed, due to the durability of residential real estate, decisions made today on the development of the urban form of cities will strongly influence how optimally residential preferences can be met in the future. Hence, this paper explores how ‘green’ and ‘grey’ residential land use in cities can be balanced in a way that is sustainable in the long term.

Predicting residential preferences, in order to indicate the sustainability of urban form and the way it is developed, is notoriously challenging. Predictive models can be valuable in this, but however complex and comprehensive they may be, they offer a limited perspective on a fundamentally uncertain future (Horowitz 2002). Perhaps for this reason, as outlined in James et al.’s (2009, 71) research agenda, there appears to be insufficient knowledge on how “*the resilience and adaptability of urban areas to future economic, housing and environmental demands [can] be enhanced through appropriate design and management of urban green spaces*”.

In order to increase our understanding of how sustainable the balance between ‘green’ and ‘grey’ in today’s urban residential areas may be, this study looks at the top price-segment of residential property. In doing so,

it aims to come to a ‘guesstimate’ of the amount of land that is necessary to satisfy people’s *ultimate* preferences for green space surrounding the home. We say guesstimate because we do not want to overstate our case: our estimate may hold an important message, but we acknowledge that we are merely trying to find *some* solid ground amidst extreme uncertainty about people’s preferences. We extend the theoretical line of thought that underpins hedonic price modeling. People’s ‘ultimate’ preferences are derived from the parcel sizes of properties that are acquired by the rich: those whom are subject to a budget constraint so negligible that they have the relative freedom to buy property which reflects their ‘ultimate’ preferences most closely. Therefore, using information on the absolute physical dimensions of the parcels of properties that are bought by the rich, this paper develops the so-called ‘residential land use footprint of the rich’ as an indicator for the sustainability of urban residential form.

The ‘residential land use footprint of the rich’ captures the demand for land when all inhabitants of distinct regional property markets would live in homes with parcels of a size that is common to the rich, divided by the amount of land within each market that could be developed. This then indicates how well each market’s land supply can absorb people’s ultimate preferences for green space surrounding their homes. In doing so, the paper provides a simple yet powerful exploration of the general population’s ultimate preferences for ‘green’ or ‘grey’ living. This holds important inspirational value for urban planning, even as the presumed preferences may remain *latent* due to mechanisms of competition on the land market. Indeed, this paper intends to explore the ultimate preferences that people have for ‘green’ and ‘grey’ living, which may add to the ongoing debate on how green, or how centralized, or decentralized we should build our cities (Breheny 1996; Kühn 2003; Matsuoka & Kaplan 2008), rather than to forecast if *materialized* residential wishes of the general population will converge towards those of the rich.

As we measure the residential land use footprint of the rich, we use transaction data that comprise about 80 %

of the Dutch residential market for single family property over 2009-2012 – allowing for the observation of 2,303 single family properties that sold for at least € 1 million.

The findings show that if the general population were to live with as much green space directly surrounding their single-family homes as the rich do, the demand for residential space would exceed the supply of developable land in several regional property markets considerably. This is especially so in the more urban markets; even there people prefer properties with relative large parcels as compared to the parcels of the properties bought by a more general population.

The results pose an open challenge to urban planning: can residential areas be designed that are highly green and at the same time accommodate preferences for high urbanity? We may be required to rethink conventions in urban planning such as, for example, the supply of single family property with private gardens in urban areas. To cite Ewing (1997, 109): "*if you count people's yards, there is abundant open space*". This seems inefficient in the long term, since "*an acre of land used as a pleasure garden for the enjoyment of a single family can never rise above its initial productivity in that use*", as Hirsch (1976, 20) notes. Perhaps gardens should more often be substituted for public green in order to increase the leisure productivity of involved lands, which appears reasonable if the demand for land is high (Cheshire & Sheppard 2004). As such, the results of this study appear to challenge the land-use efficiency of the way contemporary single family residential property, and urban form by association, is designed.

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Session 3:

Actors and stakeholders

Three families for three homes. Trajectories and fates of single-family homes in informal Rome

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Leveraging on previous work done by the author in the broad field of the production, evolution and governability of urban informality in Rome, the paper intends to present and discuss deeper issues related to the long-term agency of families involved in the production and use of informal housing with a particular reference to emerging evolutions the demographic, economic and fiscal realms. Based on the use of qualitative techniques such as in-depth interviews and life histories experimented in the field of urban history and ethnography, the paper presents and discusses three case studies of families having promoted and used informal housing.

The long abstract is structured as follows: 1) a presentation of the overall development of informal housing in Rome, 2) a discussion of its rooting in the structural features of Southern European housing systems and 3) an outline of the issues presented and discussed by the three case studies.

Rome: the rise of the informal metropolis

Between 1945 and 1975, Rome's population grew by almost 800.000 inhabitants, mostly the result of internal migration from southern and central rural regions. The booming housing demand associated with the demographic increase proved to be a challenge for a deeply unbalanced local urban planning and a housing provision system that, since national unification, had been characterized by the relevance of private land interests, the lack of a consistent public inventory of developable land, the over-production of middle and upper class housing and the under-production of working class housing.

In this context, much of the housing demand from migrants employed, both formally and informally, in the low-skilled service sector and more generally from the lower classes was left unanswered: the lack of affordable housing on the private market was coupled with a persistent under-production of public housing that was functional to the hegemony of private land and real estate interests over the planning process. From the 1950s, a consistent component of this de-

mand was oriented towards solutions provided by an expanding system of informal and illegal housing provision. Informal settlements of variable size and quality continuously expanded within the city and in its periphery throughout the postwar decades: in 1951, 150.000 people lived in such settlements, a number growing to 400.000 in 1961 and finally peaking to 800.000 in 1981.

Much of the informal activity led to the creation of "borgate", informal settlements developed on privately owned green-fields mostly located in peripheral areas close to major arterial roads. Most Borgate followed a similar development pattern: land-owners excluded from development opportunities by urban planning decisions made their land available through the establishment of a parallel illegal land market, lower-class migrants and romans bought, with or without the mediation of third parties, individual plots of land and later developed these plots often in the form of self-designed and self-built single-family homes.

Over time, the process increased in scope and sophistication with the involvement of a wider range of mediators and professionals and, from the 1970s, with the appearance of a housing supply oriented to the middle and upper classes. The informal nature of borgate was manifold: it encompassed the illegal subdivision and marketization of land, the building of housing not in compliance with the established city planning regulations and procedures, the resort to labour and design services provided either by the same inhabitants either accessed on the "black market" and, finally, the lack of security of tenure.

From family agency to the politics and policy of informality

As discussed, since the 1960s, Italian critical social theorists had explained the rise of informal urban settlements as one of the main socio-spatial products of the "backward modernity" characterizing the process of urban expansion and modernization of post-war Rome. In this perspective, the development of informality has

been one of the most evident epiphenomena of the positioning of the city within the “southern european housing system”: as in other southern european cities, urban informality in Rome has been the product of internal migrants’ large scale activation of family-based housing strategies organized around self-promotion and real estate wealth building in the context of an enduringly weak labour market and welfare state.

The state – in its articulation across different scales, from the national government to the city administration – played a strategic role in the consolidation and perpetuation of such strategies and, therefore, of their larger implications for the development trajectory of the city of Rome. This role was played both passively – in the form of the lack of action in certain domains – and actively – in the form of policies explicitly treating the issue of urban informality. The context of an enduring pattern of mobilization of residents living in borgate and to their inclusion in the political system at the local and national levels, starting with the 1960s an array of planning decisions allowed a first formalization of many of roman borgate. However, these planning decisions did not solve the problem of the key issue of tenure: despite a first regional legislative attempt in 1980, the legal controversy between the state and the individuals having built informally had in fact to be resolved by national legislation. Finally, in 1985 – after a series of failed attempts and in a heated political climate – the parliament passed the so-called “Condono edilizio” that introduced an amnesty for people having built illegal housing for their own use granting them the right to become owners of their homes. According to the new legislation, in order to fully legalize their properties, individuals applying for the Condono had to pay a fine and a development fee while the city administration had to implement regeneration plans – Piani di recupero – aimed at realizing basic infrastructures and services according to established national planning regulations. With over 400.0 requests, Rome became the city with the largest amount of condono files to be processed in the country.

Three families for three homes: agency trajectories in roman borgate

Since the condono, despite enduring differences in the access to key amenities and services, borgate have come to represent a relevant and distinctive component in the offer of housing solutions and urban lifestyles in contemporary Rome: multi-generational single family housing is associated to highly privatistic understandings of urban life. This enduring relevance poses pressing issues to housing and urban policy-makers in reference to the issue of how the agency of owners is evolving interdependent set of factors in the demographic, economic and fiscal realms.

In particular, these key dimension of agency will be address:

- The ways in which families accomplished their migration projects, their access to the local – formal or informal – labor market and their first access to housing in the city;
- The ways in which they elaborated the project to access better housing conditions in the form of informal housing self-promotion and the ways in which they entered the informal land market and acquired the possession of the land asset to be later developed;
- The ways in which the design and construction of the house were implemented – and more in particular the forms through which the mobilization of design and labor actually occurred – and the ways in which the house was reshaped across the decades following evolving family and other needs;
- The ways they participated to collective action, to the establishment of structured relationships with parties, urban organizations and institutions and accessed the formalization policies and devices made available by the city and the state;
- The ways in which today the asset is being repurposed – both as a physical asset in its use-values dimension and as a financial asset in its exchange value dimension – in the context of a changing family structures, real estate fiscal retrenchment of the state and a lasting economic crisis.

Single-Family Homes – There's life in the old dog yet!

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This contribution to the Conference "Single-Family Homes under Pressure" bases on the dissertation "City or Suburb – Families' housing options in social change, researched in Düsseldorf-Innenstadt and Neuss-Allerheiligen".

Starting with the identification of the families' current needs, the advantages of the so-called "new option city" are examined and compared with the facilities that can be examined in suburban areas. This comparison leads to surprising results.

The dissertation "City or Suburb – Families' housing options in social change, researched in Düsseldorf-Innenstadt and Neuss-Allerheiligen", finished in 2015 takes a close look at the typical Single-Family Homes structure of suburban areas concerning their fitting to the upcoming families' everyday life in the Late Modern period in Germany and compares identified possibilities and characteristics to the ones that could be examined in cities.

In Germany, the shift from Fordism, with its prescribed role models, family structure and living patterns, into Late Modern Society, in which these patterns are seen to have evolved and changed, has been seen to have impacted on families' housing options. Suburban life-

style has been regarded as the dominant pattern for decades; now urban environments are being discussed as suitable options for families as they are seen to provide more timely opportunities especially for enmeshing child rearing and career. Although in fact there is a certain awareness of families in inner city areas, official statistics continue to indicate that families are still moving to the outskirts.

The thesis postulated for this study implies that the mobility of families is not in fact dictated by dominant pattern but rather by their individual lifestyle choices, as well as their typical needs and the quality of the settlement structures.

Part A of the thesis defines "family" more precisely and explains the different dimensions of family life including individual needs of the individual members, effects of social change, and typical strategies for dealing with constraints. They can be separated into qualitative, (e.g. traffic abatement for a saver child's play) quantitative, (e.g. number of rooms), and time-management aspects, (e.g. saving time thanks to structures for improving flexibility, for externalising and rationalising). The results lead to a kind of catalogue of requirements.

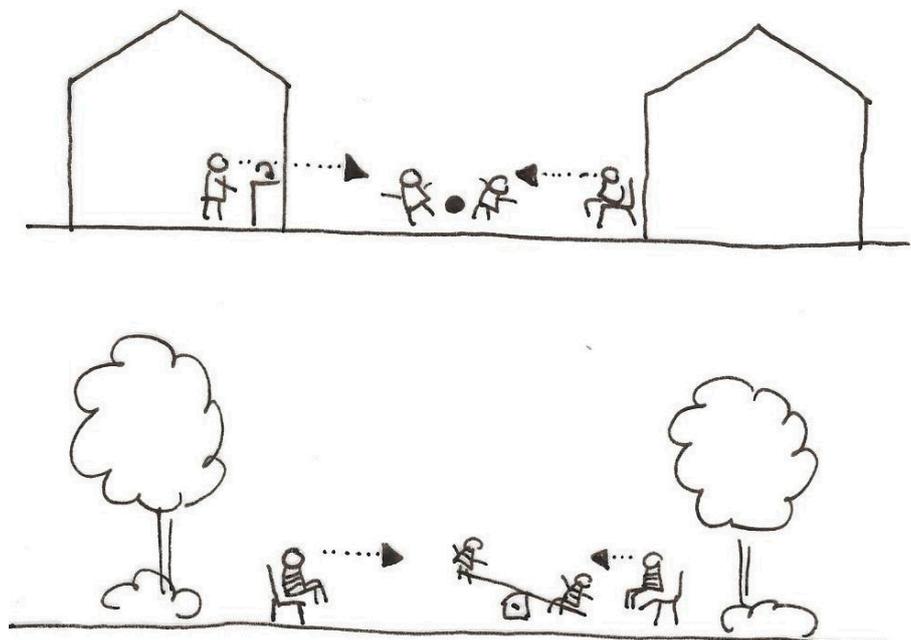


Fig 15: Places with social control for guarded child's play: Suburban play road and urban „Kontaktthof“ (source: Tintemann)

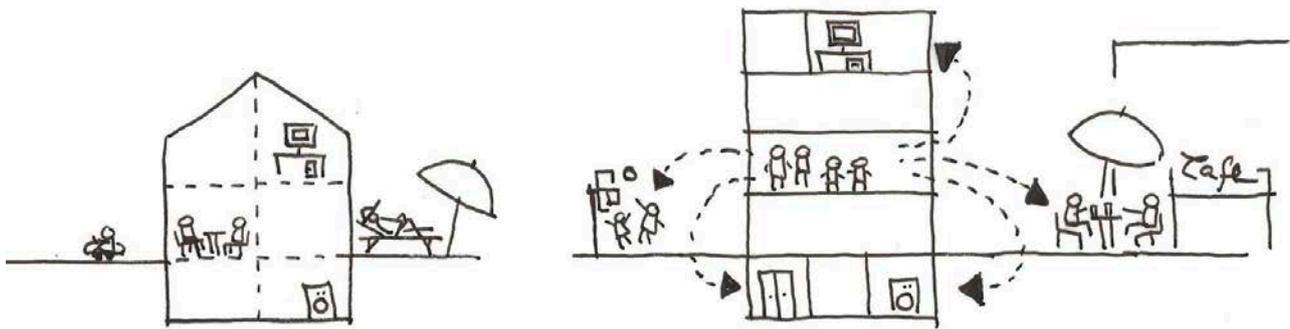


Fig 16: Private garden / “living space wonder” in suburban areas – “Oasis” / unbounded functions in urban areas (source: Tintemann)

This catalogue serves for a matrix that allows comparison between different types of settlement structure and examination of their fitness for families.

Part B presents the explorative section of the research. Düsseldorf and Neuss-Allerheiligen were chosen as examples of urban and suburban structures. In both places, families were selected for interviews from Late Modern Society – social types with both parents working. They were asked about their motivation in choosing the areas they lived in at present, about their housing situation and about their daily routines and on-site time management. Their answers have been described, systematised in theme complexes and analysed. Both urban and suburban strategies of living have been compared. On top experts of local social and planning institutions as well as of the real estate management have been interviewed.

Part C contains the conclusions of the research. One significant result is the evident increase of options, because urban as well as suburban settlement structures evidently provide opportunities for good living conditions. Families are no longer following a pattern or ideology but thinking more practically of what their

life circumstances do need in fact. Therefore families are interpreting spaces in new ways, modifying their functions and making them fit. Thus the importance of pattern is giving way to the superimposition of individual lifestyles.

Single-Family Homes – There’s life in the old dog yet!

In this frame also Single-Family Homes in suburban areas do fit. Not only chances for new technical or design standards and a comfortable amount of living space are better, there are also possibilities for enmeshing child rearing and career.

As the research shows families need to externalise. One example of the strengths of the suburban choice is the “home advantage”. As many of the parents in the study grew up in suburban settings themselves, they are able to draw on a good supporting network, (old friends and grandparents). Some even venture into establishing “multi-generational” households in a developing area. Similar effects in new developing areas with Single-Family Homes are caused by their homo-

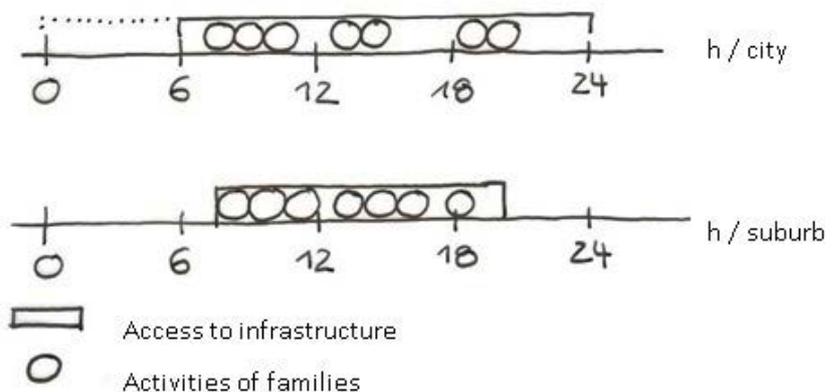


Fig 17: Access to infrastructure – families’ activities in suburban/urban areas (source: Tintemann)

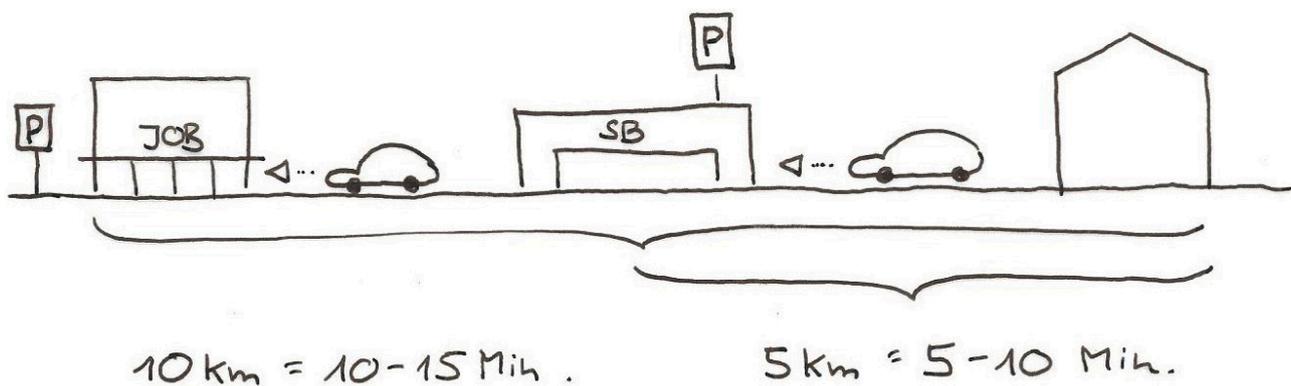


Fig 18: Optimized individual motor car traffic in suburban areas (source: Tintemann)

generity. All families are in a similar stage of life with similar challenges and needs. They recognize each other as likeminded and trust each other. Parents tend to share responsibility in this ambience. In Cities this need is substituted more and more by specialised locations for like-minded persons to share, where everyday life can be extended into public space and social networks developed in this way. The families themselves call them "Oasis" or "Kontakthof" (a place which supports getting in contact with each other). Social networks are in every sense important for families to optimize child-care-duties by externalization.

Another undeniable advantage of Single-Family Homes is the abundance of space-compared with the range in inner cities. They offer good conditions for unbounded modes of work, which are supported by new communications media. Further they offer also space for hobbies and meetings. In urban areas the lack of space makes changes of location necessary. Public spaces can be suitable locations, when they provide demanded qualities.

An advantage of the urban ambience is a certain "fla-trate-city-character," which allows parents the flexibility to open larger windows of time in their daily sched-

ules and more opportunities for their multiple activities. Shops and social infrastructure are open up to 24 hours and near to reach.

Time is also a subject in the outskirts were due to the low density of population facilities are far away and early closed. But here rational management methods such as storage in big freezers and bulk buying do save time for mobility as well as the optimization of individual motor car traffic does.

So, one central conclusion is that new developments with Single-Family Homes are still attractive. The demand on ground will continue with every new growing generation. But every new Single-Family Home site will become an old one pretty soon and the biggest challenge will be to keep the elder existing suburbs alive and attractive. One chance lays in the change of the self-conception families have nowadays. Being a family is one chapter of life and no longer the one and only aim. That means after 25 years many couples may make up their minds about what to do without children in a Single-Family Home. There is a trend to reorganize social live with friends and change the living space. Therefore the fittings of old suburban areas should be adapted.

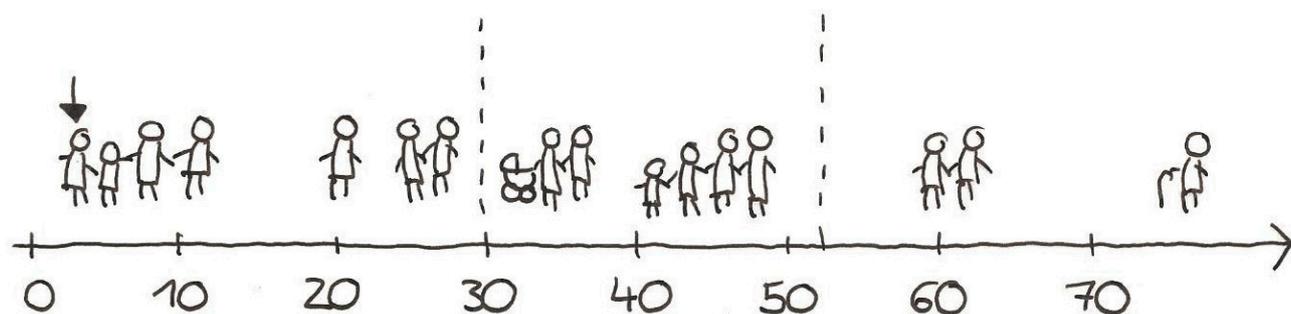


Fig 19: Biography of family households (source: Tintemann)

The results of this research conclude with recommendations for action in the field of town planning, because one of the most important challenges for those responsible for communal planning is to provide attractive and suitable living spaces – especially for families. One recommendation is to keep an eye on the old Single-Family Home sites. It is important to keep them as attractive for families as new sites. “Kontakthöfe” and castling concepts could be practicable answers.

Session 4:

Valuation and market impacts

Understanding Housing Depreciation: Inter- and Intraregional Disparities in the Valuation of Single-Family Homes

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Owing to the durability of the housing stock, demand shocks might not only lead to asymmetric house price effects in the aggregate (Glaeser & Gyourko 2005), (Maennig & Dust 2008), but also to different effects along the quality distribution of houses. If demand has fallen rapidly, housing prices will decrease and price structure will redistribute vacancies across houses of different quality (Smith & Tesarek 1991), and in turn affect the relative price difference between a newly constructed house and a house of a particular lower quality².

Due to the lack of measuring residential housing depreciation appropriately, building age usually serves as an approximation for all elements of depreciation instead³. Moreover, previous empirical studies find that residential housing depreciation rates are neither temporally, (Clapp & Giaccotto 1998), nor spatially stationary (Smith 2004). (Clapp & Giaccotto 1998) argue that if the age-related depreciation parameter is considered, the non-uniformity in the depreciation rate can be mainly attributed to demand- and supply-side determinants, such as demographic effects, construction cost, local employment, and distribution of income, that are not homogeneous among regional housing sub markets.

However, owing to the bundled-good characteristic of residential housing, depreciation is highly heterogeneous and probably non-linear. Beside of depreciation in use value owing to obsolescence and physical deterioration, age-related depreciation rates can be biased due to heterogeneity in maintenance efforts and differences in absolute land values caused by various neighbourhood effects and local externalities. Moreover, age-re-

lated housing depreciation may be also distorted by the presence of a positive call option which represents the opportunity to redevelop existing housing characteristics by given construction costs (Clapp & Salavei 2010). The value of the call option increases with the locational value and decreases with structural intensity. Accordingly, house prices do not seem to move equally within single housing markets, and distributional dynamics can hardly be measured by single statistics, such as the median home value or a quality-adjusted price index.

In this paper we examine disparities in age-related housing depreciation from an intraregional and a regional perspective. Using offering prices for single-family homes from Germany, we firstly observe regional-specific depreciation rates by applying hedonic models to regional housing markets separately. As pure age-related housing depreciation can be non-linear, highly complex, and biased by heterogeneity in maintenance, we use decade-specific depreciation rates in tandem with quality-based interaction effects controlling also for already fully redeveloped houses as well as for possible redevelopment options. Depreciation rates are biased if houses are not maintained equally and locational valuation is correlated with housing ages and single-family homes with different building ages are not randomly distributed over space. Moreover, quality and quantity supply effects may lead to local differences in price dynamics and speed of adjustment due to differences in market tension and bargaining power (Caplin & Leahy 2011), (Harding, Knight & Sirmans 2003). Against this background, we control for heterogeneity in locational determinants and locational supply effects by means of spatial econometric methods.

Secondly, we are interested whether the slope of the price-function changes with submarkets' demand and supply characteristics, such as demographic changes, land-supply, and offered housing stock. For this purpose, we use univariate statistics to examine whether implicit prices differ significantly among regional housing markets, as well as decade-specific depreciation rates and multivariate regression to examine which regional determinants have bearing on distributional price effects.

² The traditional urban economic model as well as the filtering theory would predict differences in appreciation rates if fundamentals, e.g. income, number of households among others, would change. For example a decrease in population will lead to excess supply, decrease housing prices, and thus leading remaining households to ask for a higher amount of housing quality, c.p.. Additionally, in the Mills-Muth model a decline in transportation cost leads to a flattening rent gradient resulting in higher housing appreciation at the perimeter of the city.

³ Despite of differences in structural characteristics, such as the total living space among others, depreciation contains physical deterioration and a loss in functionality owing to obsolescence.

By the comparison of offering and transaction price data, we show that the disparity in demand for housing quality is likely to be biased upwards as a result of a selection bias that we call a “quality selection bias”. We find a correlation between estimated regional depreciation rates and mean quality of transacted single-family homes. This selection bias is likely to occur as transaction data is unable to control for dwellings that have been left unsold.

Controlling for intraregional and regional heterogeneity in housing depreciation estimates, provides two important findings: Firstly, age-related decade-specific depreciation rates are highly heterogeneous, nonlinear, and identification is aggravated by differences in maintenance and locational effects. Coefficients on age-related housing depreciation shown to be biased upwards in the absence of other variables capturing heterogeneous effects in depreciation.

Secondly, decade-specific depreciation rates shown to be highly regional-specific. For example, price differences between newly constructed single-family houses and houses built before 1960 range from close to zero to 32 percent. A large share of depreciation in housing is related to demand-side variables, such as a change in number of households. However, the largest share of the regional heterogeneity in housing depreciation can be attributed to supply side variables, such as regional changes in developed land and the share of older single-family houses on all offered houses. Considering the durability of the housing stock, we conclude that excess supply will not only lead to asymmetric house price effects in the aggregate but also to price effects along the quality distribution. Thus, estimations emphasize the importance of supply side variables for house price dynamics.

These results are important as housing depreciation has economic relevance. As homeowners should only invest into their housing equity through maintenance when replacement costs are above the asset value, rapidly fallen prices lead to lower rates of re-investment and this in turn will strengthen the log price differences and decreases the probability of subsequent use of lower quality houses (Gyourko & Saiz 2004). This is of relevance for two reasons. Firstly, much of the housing stock of single-family homes in Germany still stems from the decades after the second world war. This housing stock has now reached the end of its life-cycle and is facing a generation change in use in current and

upcoming years. And Secondly, distributional price effects are of interest considering the fact that Germany and many other countries in the Western hemisphere are struggling recently with strong rural-urban polarization tendencies owing to structural changes at the labor markets in tandem with changes in demographics. Consequently, in many regions supply is expected to exceed demand in upcoming years. Accordingly, measuring differences in depreciation of residential housing is not only important for the investment side of the economy but also for the understanding of how housing markets behave in order to assess public policies (Harding, Rosenthal & Sirmans 2007), (Malpezzi, Ozanne & Thibodeau 1987).

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Price decreases of single-family houses in Germany: Structure or location?

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Introduction

In many parts of Germany, price declines of single-family houses (SFH) are observed. This contribution addresses the question whether such declines in prices are induced by changes in the preferences for the (in many cases) non-urban, non-central locations (Maennig & Dust 2008) where many of the SFHs are located. Alternatively, the price adjustments could be due to changes in the preferences regarding the form of living, implying growing preferences for apartments (APT).

We analyse the case of the German capital city Berlin 1990-2015, where a decent number of both, APT and SFH, are located in similar locations and centralities. In a first step, we estimated a hedonic price model for APTs exclusively. We found a significantly negative coefficient for our centrality proxy (distance to the Berlin CBD), and the coefficients using exclusively SFH Data point in the same direction.⁴

In a second step, in order to calculate markup of SFHs compared to APPs we use difference in differences models.

We find a significant preference for central locations, but no differences in such preferences between APT and SFH when decently controlling for location, amenities, and socio-economic variables.

Data and Methodology

We use all transactions of SFH and APP from the Kaufpreissammlung (data on purchasing prices) in Berlin from 1990 to 2015, with some 40.000 observations for SFHs and 280.000 observations for APPs. Table 1 displays the descriptive statistics of some of the most relevant variables. In most years, our data set contains more than 5.000 APT transactions and more than 1.000 SFH transactions. From 1990 to 2015, prices for SFHs increased less (25 %) than prices for APTs (49 %). Figure 20 displays the locations of some mayor amenities as well as socio-economic variables.

Tab 1: Mean Values of characteristics over time (ource: Beimer, Maennig)

Year	SFH						APP					
	Price	Age	m ²	Distance to next Station	Migration background in %	Obs.	Price	Age	m ²	Distance to next Station	Migration background	Obs.
1990	287.623	37	142	1.364	19	814	89.621	48	68	691	33	5.420
1995	331.686	43	143	1.422	17	1.135	131.781	49	69	729	31	5.203
2000	255.970	44	146	1.453	16	1.385	123.409	61	74	642	29	8.900
2005	227.966	43	147	1.409	16	2.181	110.858	68	76	660	28	10.810
2010	261.087	46	153	1.448	16	2.093	136.172	70	77	613	30	14.080
2015	362.735	49	135	1.424	17	1.642	183.632	71	73	681	30	14.921
1990-2015	277.026	44	148	1.407	16	40.904	133.712	64	73	667	29	283.458

⁴ Details are available from the authors.

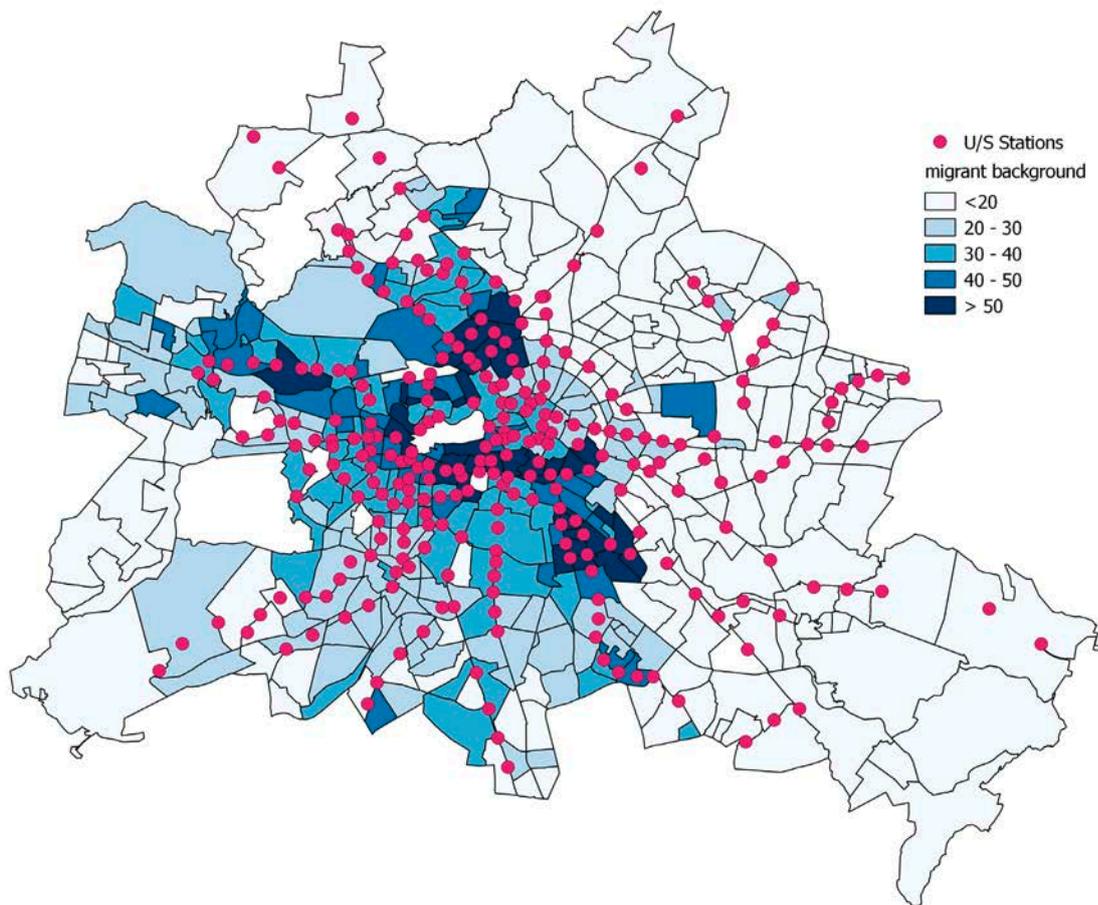


Fig 20: Distribution of Migration background and U/S Station in Berlin (source: Beimer, Maennig); Data basis: GIS Data (Geoportal Berlin)

We start with a simple semi-log model which has the advantage that coefficients are easy to interpret (Ahlfeldt & Maennig 2015). We test different specifications of the model, starting with OLS. In addition, we compare a model with FE (Ahlfeldt et al. 2016) and a model with a spatial lag parameter (SpatLag) (Small & Steimetz 2012). We introduce interaction terms for every explanatory variable with the SFH dummy. Furthermore, we allow parameters to vary over time by using IT with the year dummies (Fik et al. 2003; Ahlfeldt et al. 2016; Füss & Zietz 2016) which allows us to control for yearly changes in population's preferences instead of assuming a fixed point in time of changing preferences.

Results

There is a significantly negative trend in markups for SHF to APP if we don't control for any characteristics (model 1 in table 2) which confirms the insights from table 1. As soon as we control for size and age

(model 2), or additionally for distance to amenities (model 3), the trend reverses. When additionally including sociodemographic variables no more markup trend for SFH can be detected.

The estimates are robust to the method used. The model using FE has the lowest AIC value and the highest degree of explanation. Figure 21 shows the estimated markups over time using Model 3, using the conversion of (Halvorsen & Palmquist 1980).⁵

The Berlin case implies that negative trends in prices for SFH may be induced by changing preferences for (central) location, but less so by changing preferences for SFHs.

⁵ "The relative effect on Y is $g = \exp(c) - 1$ " Halvorsen & Palmquist (1980) p.1.

Tab 2: Trend estimation of the markup variables and results of the Model Estimations (source: Beimer, Maennig)

Model	Model 1	Model 2	Model 3	Model 4
Variables:	Time Dummies, Block-FE	Model 1 +(Floorspace), Age, Age ²	Model 2 +distance to amenities	Model 3 +Socioeconomic variables
Time trend	-0,0041*	0,0105*	0,0086**	0,0022
Constant	0,6550***	1,1020***	1,2810***	0,8020***
Time trend per m ²	-0,0040*	0,0054*	0,0018	-0,0198
Constant per m ²	0,0568	-0,1240**	0,0484	-0,4810
Original Reg.				
Observations	324.362	324.218	324.218	323.589
adj. R ²	0,527	0,791	0,796	0,805
AIC	444.876	180.131	171.991	157.959
adj. R ² per m ²	0.491	0.529	0.541	0.560
AIC per m ²	192.249	167.198	158.895	145.659
* $p < 0,05$; ** $p < 0,01$; *** $p < 0,001$				

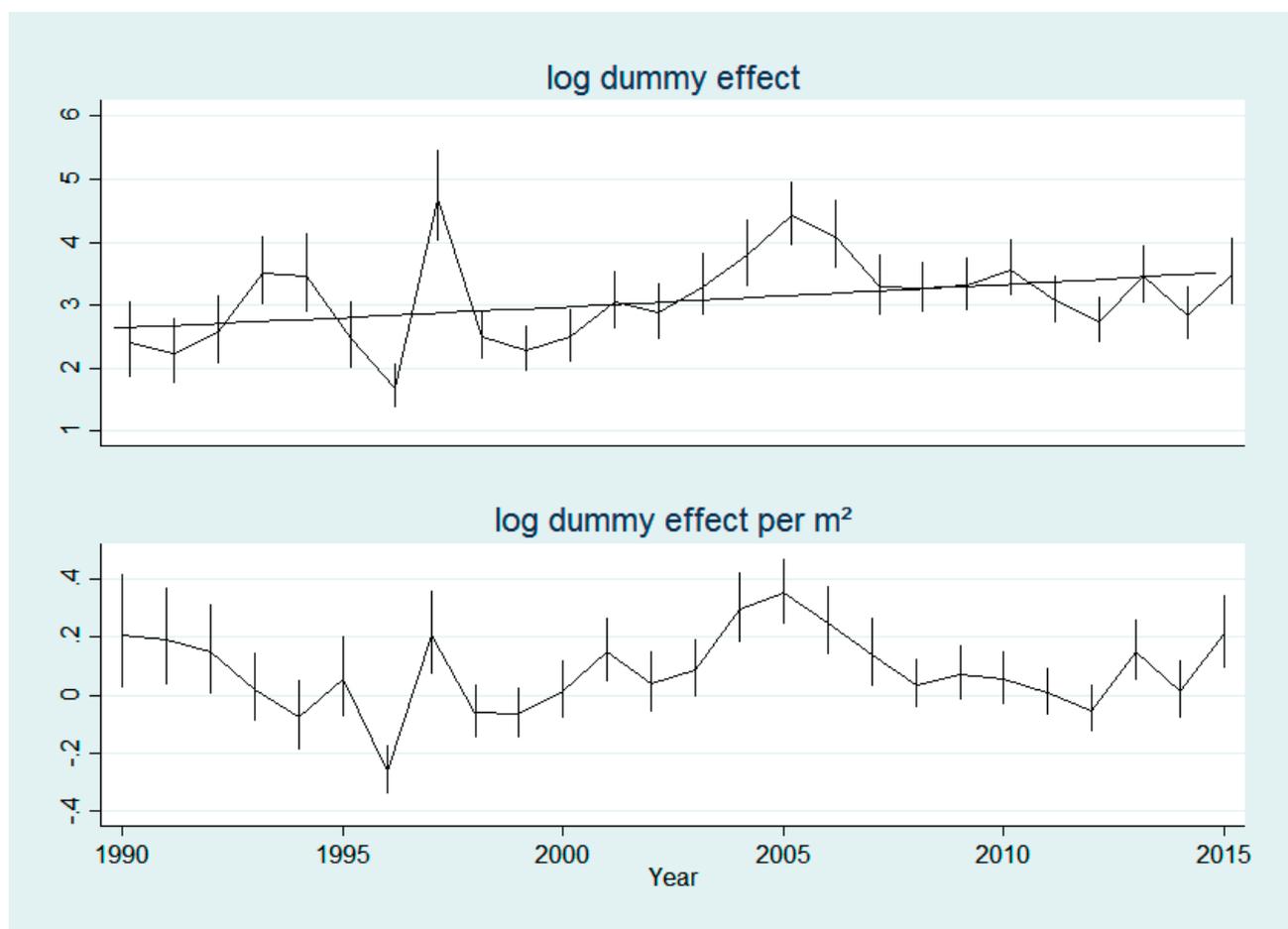


Fig 21: Trend estimation of the markup variables using Model 3 (source: Beimer, Maennig)

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Session 5:

Planning policy and spatial effects

Analytic Space Definition in the Single-Family Homes Maturation Discourse

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A growing interest among practitioners and scientists in suburban residential areas is paid to the future development of single-family homes characterized by old housing stock and aging inhabitants. The main reason is that suburban residential areas in the developed countries including Western Europe have single-family homes constructed during the second half of the 20th century. These are now becoming a subject of generational shifts in housing demand according due to demographic trends together with the current preferences for urban housing. Residential areas of single-family homes are believed to be facing fundamental changes in conditions for their further existence. At the same time, empirical studies based on assumptions summarized above show a potential risk, but only a very limited evidence of real fatal dilapidation. Such seem rather to appear only in extreme rare cases of oversupply in peripheralized areas.

A general challenge in conceptualizing maturity and adaption research on single-family homes in Germany is its still limited theoretical background. Research is built on conceptionalistic approaches based on particular suburban and peripheral area discourses as well as on interpretations of statistical analyses and their conceptual interpretations. These rather rare works oppose a relatively broad field of descriptive empirical studies, which however remain partly insufficiently conceptualized in a broader context and thus disconnected from general theoretical frames. Based on what Reimer (2012, 53 f.) calls a discursive production of particular images rather than methodological rigor, they remain partly anecdotic. Also characteristic remains the limitation of interpretation of lifecycles according to the urban ecology approaches without a broader view towards other disciplines and their concepts of cyclic change. Especially further broad discourse on development and change in urban sociology, the development path discourse in economical geography or the concepts based on system theory remain widely disregarded.

This contribution argues that the canonical point of view usually applied on the phenomena of maturation, based on a traditional view of the single-family homes

as a specific phenomenon of urban outskirts sprawl during the industrial era, is currently narrowing the analytical research approach. First is the assumed monostructural nature of the suburban settlement, which points out areas and limiting the view on identical structures and functions, such as suburban single-family homes of same age and type. This assumption is often being institutionalized in research approaches by selecting physically homogenous residential quarters on one hand, and by disrespecting existing differences in framing conditions for one type of housing in different spatial and functional contexts, such as its location within or outside of metropolitan areas. The complexity of the housing market thus surmounts the complexity of the limited set of location, maturity and morphology concept, used as a base for conceptualizing studies. Second, single-family homes areas are merely being seen as an area of rather peculiar, individual interests, lacking common and endurable stakeholders' and advocates' arenas which would steer a change in order to transform suburbia by intrinsic powers.

Maybe the most evident consequence of these assumptions for single-family homes in Germany in research is its spatially and thematically limited debate. Until now, only few authors have emphasized the need to regard the issue of suburban housing within a broader morphological typology, pointing to the importance of the interaction between the morphologies for maturation process strategies. In studies on spatial risk assessment for problematic areas among single-family and double-family housing such as Fina et al. (2009) a measurement for the risk of dilapidation is being proposed. This includes the indicators of housing, demography and spatial use. Alternatively, a study by Hesse et al. (2013) shows that, in spite of the changing statistical picture of the suburban areas in Germany in regard to demography and physical conditions as the most evident consequences, by far not every mature area in a demographically and/or economically stagnating or declining periphery, even in shrinking regions, is actually dilapidating or under a fundamental threat.

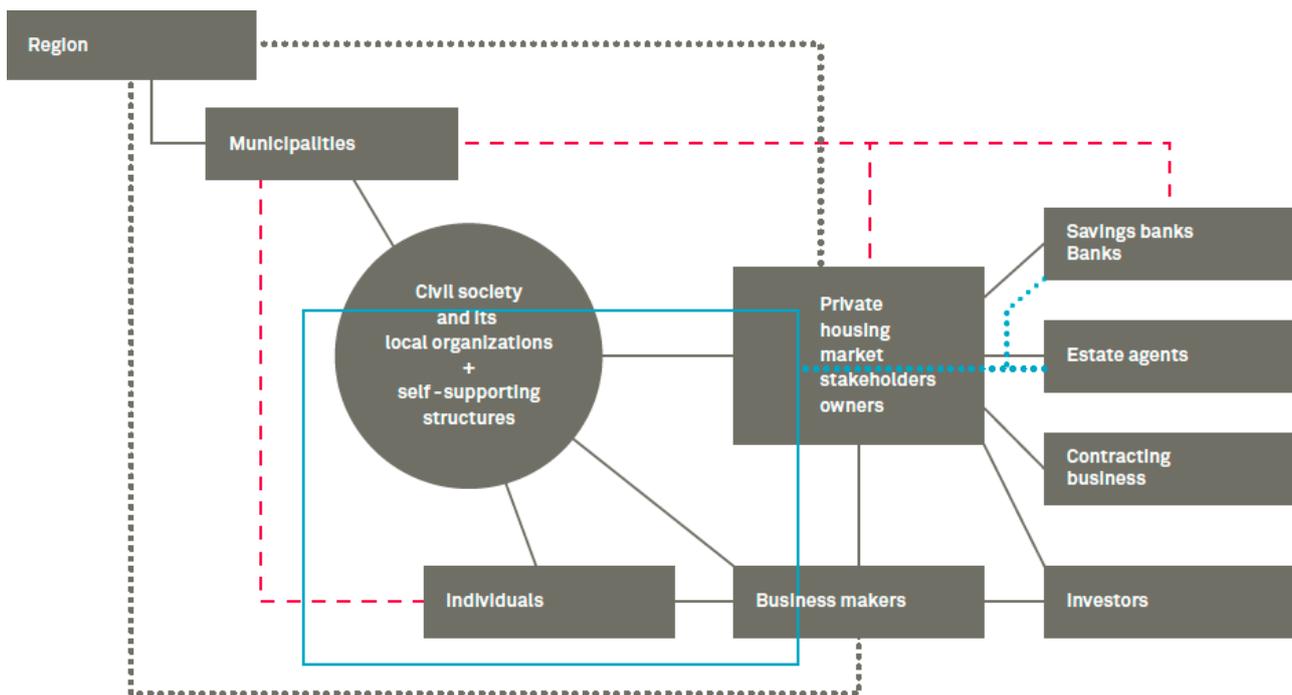


Fig 22: Local stakeholder arenas as an additional layer to the spatial definition of single-family home area (source: Polívka 2015, 208)

This leads to a focus on how and how far single-family homes may follow a strategy to adjust, maintain and internally keep themselves stabilized. Despite the important plea for a municipally led and 'demand-oriented' adjustment (Nierhoff 2008) and correspondingly recommended actions, no strong evidences has yet been given for significant municipal concepts or even for action beyond data monitoring in suburban residential sites. One reason for this may lie in the fact that, as stated above, a certain portion of single-family homes research is focusing on those often tackled by a specific morphology and age as well as demography, instead of seeing the housing issue in the context of its surrounding (sub-)urban functional and social settlement area or "quarters" (Schnur 2014). On the contrary, municipal stakeholders, together with others, do deal with the issue of individual perspective of a particular area within a broader context of the whole settlement and individual life perspectives and the interaction within them, including the issue of canalizing housing demand for different social and demographic groups. From such a point of view, the context of single-family homes is including not only a certain type of family homes at a certain maturity stage, but also apartments, senior residences and homes as well as social and technical infrastructure and services in its context, such as churches, kindergardens etc. These are interconnected

with general municipal development strategies, including strategic plans for long-term social and technical infrastructure measures, but also much more concrete and immediate plans, such as for designating new residential areas and thus expanding settlement area. Furthermore, they include the individual targets, strategies and activities of owners, inhabitants, societal, economic and other stakeholders at place. Inhabitants may act contextually to their very individual life perspectives, thus further diversifying the development perspectives of even morphologically and demographically homogenous areas (Polívka 2015).

If we follow the concept of spatial and stakeholder diversity within the single-family home areas, it leads to the notion that within their context suburban residential neighbourhoods may possess and utilize both intrinsic and resilient capacities to adjust to both slow and sudden changes, and that these capacities yet not have been sufficiently concerned when conceptualizing the interconnection between maturity and decline, which partly are not sufficiently mirrored if focussing only on particular parts, such as a certain type of housing. Exploring the adaptive patterns of the single-family homes in the context of the suburban residential areas may finally question not only the clearly linear development along a given trajectory evoked by structuralistic theories and consequent analytic approaches. It might

show areas of single-family homes generally as not only more intrinsically resilient but also more adaptable than usually assumed.

The contribution therefore on the one hand analyzes processes of change and adaption of suburban residential areas under the conditions of the maturation process. The analysis aims on contributing to the systemic notion of processes changing maturing systems within their natural lifecycle and its interdependence with deliberate adaption under particular stakeholders' constellations. On the theoretically conceptual level it seeks to explore the key attributes of the development path for evolutionary lifecycles within the context of resilience, discussing both the phenomena of stable maturity and continuous adjustment.

Deconstructing the lifecycle concept, the contribution on the other hand analyzes the canonical view on mature suburbia based in the traditional growth-maturity-decline pattern and introduces a pluralistic concept of path dependent evolution based on a multi-leveled interdependence between particular levels of space, stakeholders and adaptive action. On behalf of two empirical studies conducted in German single-family home areas, an alternative concept of open multi-leveled interpretative and analytic tools for understanding the development paths of mature suburban systems is being suggested. It tries to overcome the assumptions of homogeneity, fatality and a stakeholder absence by conceptualizing the embedded areas of single-family home with a flexible concept of the 'systemic space', allowing intrinsic and external development based on stakeholders' arenas as the central adaption-steering potential, thus putting it at the core of strategic planning interest in mature suburban residential areas.

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Soft densification of single-family home areas: morphologies, experiences and perspectives for the development of densification policies

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Introduction

Single-family home areas are faced with specific challenges corresponding to the dynamics of local and regional development. In economically less dynamic regions, they have recently been confronted with the process of shrinkage and the appearance of vacancies. The situation is quite different in economically dynamic city regions with a tense housing market, where these areas can go through a process of densification, particularly if they are well located within the city region. Besides the market-driven development, the densification of single-family home areas can also become part of specific urban development policies that aim to make these areas more sustainable.

In our paper we focus on market-driven or owner-driven soft densifications of single-family home areas that are realised individually within the framework of the existing building planning and building law. The term 'soft densification' was developed first in the French context in order to describe a form of densification that does not change the prevailing urban form radically (Léger 2010; Touati-Morel 2015). Even if the soft densification practices do not radically transform the morphology of the neighbourhood, they are often contested by the neighbours who do not participate actively in the densification process (see for example the well-organised protest movement in Munich: <http://www.bvobermenzing.de/flyer-gartenstadt.pdf>). Under certain conditions, densification seems to be experienced by the neighbours as a form of deprivation and loss of quality of life. If soft densification is to contribute to a more sustainable urban development, it is necessary to understand the passive neighbours' experience of deprivation and to develop a form of densification policies at the level of the neighbourhood that also takes into consideration the concerns of the neighbours. Our contribution is built on the results of an international research project (realised in the frame of the PUCA soft densification policies research programme: *Vers des politiques publiques de densification et d'intensification "douces"?*) that analysed, in two case studies in the

city regions of Lyon (France) and Munich (Germany), the neighbours' experience of soft densification. The study is based on the assumption that not only the material form of the densification but also the image of the neighbourhood and the public discourse influence the neighbours' experience of densification. Our paper is structured in three parts.

The first part deals with the description of densifications in the case study neighbourhoods of Pont-des-Planches in Vaulx-en-Velin near Lyon and Waldtrudering in Munich that have been realised within the last five years. The second part focuses on the negative experiences of soft densification by the passive neighbours. It is based on more than 30 semi-structured interviews with neighbours of plots transformed by densification in both case study areas and a detailed description of surrounding densifications. The third and last part addresses conclusions that can be drawn from the project for the development of planning policies that consider soft densification not only as an individual concern but as a matter of neighbourhood development.

Morphologies

The project made apparent that soft densification can take different forms and must be understood as a regionally and nationally embedded process (table 3). In Waldtrudering (Munich), the densification process is dominated by the destruction of the existing single-family homes and replacement by small blocks of apartments, terraced houses or semi-detached houses, whilst the densifications in Pont-des-Planches (Vaulx-en-Velin) take various forms, with horizontal extensions predominating.

In Waldtrudering the densification process is, to an important degree, realised by small real estate companies. The real estate companies aim to maximise the profit and therefore exploit the existing building authorisation for the plot to the greatest possible extent. This leads to a transformation of the neighbourhood such that what was previously characterised by plots with big gardens and small single-family houses now becomes a neigh-

Tab 3: Total number and forms of densifications in Pont-des-Planches and Waldtrudering (source: own work)

	Vaulx-en-Velin (Pont des Planches)	Munich (Waldtrudering)
Total number of densifications	62	49
Vertical extensions	2	-
Horizontal extensions	25	-
Divisions into flats	2	-
New building after demolition	8	39
New building on empty or divided plot	25	10



Fig 23: Old house on a plot with big garden and new semi-detached house in Waldtrudering (source: google street view [left photo], Kazig 2016 [right photo])

bourhood whose plots are to a large extent built up with small blocks of apartments, terraced houses or semi-detached houses with only small gardens (figure 23).

Pont-des-Planches is still characterised by a mixture of housing with small industries. The latter are replaced more and more by residential buildings through the process of densification. A characteristic of the densification process in Pont-de-Planches is the extent of owner-driven developments. The consequence is not

only a large amount of horizontal extensions that are inhabited by the members of the family that lived in the original house, but also the construction of a new house on a divided plot or an empty one (figure 24). The densifications in Pont-des-Planches are often realised not in one step, and are completed according to the availability of money: this contributes to an appearance of an unfinished and quite heterogenous neighbourhood.



Fig 24: Old house and horizontal extension and new building on divided plot in front of the extended house in Pont-des-Planches (source: google street view [left photo], Paris 2016 [right photo])

Experiences

The interviews we carried out revealed different reasons that can lead to densification being experienced as a deprivation and loss of quality of life. We will focus in this paper on two aspects that are present in both neighbourhoods of our project: the loss of intimacy and the loss of its idyllic character.

Loss of intimacy

To preserve one's intimacy in the context of dwelling means not to be seen and heard by the neighbours and not seeing or hearing them without having taken the decision to do so. To preserve one's intimacy means establishing a certain distance between oneself and the neighbours. In comparison to an apartment, a single-family home allows one to keep a distance from the neighbours and to develop a way of dwelling where the intimacy is well protected (Raymond et al. 2001). The densification of single-family home areas implies that the established distance between neighbours is reduced.

A loss of intimacy concerns above all those neighbours whose plots are directly in contact with the densified plot. Neighbours who live on the other side of the street of a densification are generally less impacted. How far a direct neighbour experiences the densification next his house as a loss of intimacy depends on a combination of material and social aspects. One important aspect is the orientation of life or – as one of our interviewees put it – the “dwelling side” of the existing house and garden that are not modified, as well as in the densified house and garden. The important parts of social life at home are very often located in one side of the house or garden. A densification is, above all, considered to result in a loss of intimacy if the “dwelling side” of the unmodified house is orientated toward the densification and if the “dwelling side” of the densified plot is also oriented toward the unmodified house. If this is not the case, densification can be very close to the boundary of the existing plot, without significantly disturbing the intimacy of the existing inhabitants.

Various participants in our study who were experiencing a loss of intimacy through densification tried to adapt to the new situation. One way of adaptation that is often cited consists in the development of new forms of inhabiting the house or garden, by changing the location of certain activities and moving them to

less exposed parts of the house or garden. The adaptations are only marginal in some cases, but can also include significant reorganisation of the use of rooms in the house. In some cases, the neighbours have no alternative, and decide to abandon the use of parts of their house or garden for activities such as sun bathing, for example. The use of existing visual or sound protections or the construction of new protections is another possibility for neighbours to adapt to the new situation. The latter are used even though they can be associated with significant expenditure.

The adaptations normally contribute to regaining the intimacy lost through the densification. But for various interviewees, they do not completely re-establish the quality of life they had before. They experience the adaptations to the way they inhabit their house or garden as a loss of liberty, and in this respect a loss of quality of life. For this reason, some of the interviewees refuse adaptations, even if the sense of intimacy in their house or garden is affected by the densification. A loss of the idyllic character is a further reason why the quality of life is not completely re-established. We shall deal with this in more detail in the next section.

Loss of idyllic character

According to some authors (Berque et al. 2006), the development of single-family houses is built on the quest for an ideal European landscape: the Greek Arcadia. Arcadia is the image of the gentle countryside, an ideal place inhabited by herdsmen living in harmony with each other and with nature. It is the subject of an idyll, a form of poem in Greek antiquity. The term ‘idyllic’ nowadays denotes this ideal of landscape and society that is pleasant and peaceful. The densification of single-family home areas is experienced by various inhabitants in a way that can best be described as the experience of a loss of the idyllic character of the neighbourhood. In contrast to the loss of intimacy, which relates only to the experience of home life, the loss of the idyllic character can refer to the dwelling experience at two different levels: life at home and life at the level of the neighbourhood in the sense of the district.

In terms of its landscape dimension, the experience of life at home as idyllic is based to an important degree on the garden of the neighbour. Densification is normally accompanied by a reduction in trees and other vegetation, and the extension of buildings on the plots which, above all in the case of new constructions or



Fig 25: View from inside a neighbour's house toward a new building that is built only 3 metres from the boundary of the neighbour's plot (source: Kazig 2016)

horizontal extensions, are nearer to one's own house. These modifications, and the strengthening or establishment of new visual and sound protections, lead to a less pleasant view of the immediate environment from one's home. Some neighbours experience the densification as a loss of space or even feel confined (figure 25).

The quality of neighbourhood relations also contributes to the idyllic character of home. They can deteriorate for various reasons due to the densification. We will focus here only on deterioration of neighbourhood relations due to cheating in the context of the densification process. This occurs when densifiers do not respect the building permission and their construction exceeds the authorised size or form. Above all in Munich, where the immediate neighbours have to be informed by the densifier about the densification project before its realisation, they relate the cheating to themselves. This experience can lead to a long-term deterioration in relations between neighbours. For inhabitants who were

not taken into consideration by a densification project in the immediate vicinity of their property, knowledge of the ongoing densification process in the neighbourhood can create worries about being directly affected by this development in the near future. The observation of the process in the wider neighbourhood and the anticipation that this could happen in the immediate neighbourhood threatens the carefree nature of life in one's own home, and contributes in this way to a loss of the idyllic character of life in one's own property.

There are also different experiences that detract from the experience of the district as idyllic. The first one is based on the disappearance of existing architectural and landscape heritage of the district. The districts of both of our case studies originate from the beginning of the 20th century. They have constantly changed and developed since then, but have conserved elements of their history in the form of specific architectural forms and characteristics of the gardens. Even if the two

neighbourhoods are not urban heritage areas, inhabitants who have lived in the neighbourhood for a longer period of time can appreciate the specific form of the neighbourhood as pleasant and become attached to it. The uniform style of more recent densifications, the loss of vegetation in the neighbourhood that goes along with them and the spread of opaque fences between plots cause a deterioration of this experience of the neighbourhood. The densification also impacts the neighbourhood relations in specific ways that make life in the neighbourhood less pleasant. On the one hand, inhabitants deplore the growth of anonymity with the arrival of new inhabitants due to the densification. Above all in Vaulx-en-Velin, they also experience it as a growth in the communitarianism of specific groups that are more focused on their own community and less open to the rest of the inhabitants. The interpretation of the densification as an unbalanced social development, a development where some inhabitants lose and others win, is another expression of the deterioration of the experience of the district as idyllic.

Densification policies

The project has made it apparent that soft densification – even if it is characterised to a large extent by respect for the existing morphology of the neighbourhood – is not always experienced by the neighbours as soft. The loss of intimacy and the loss of the neighbourhood's idyllic character are two reasons that explain why neighbours of densification projects experience them as a deprivation and a loss of quality of life. Densification policies that aim to foster the densification of

single-family homes as a form of sustainable urban development should take them into consideration. The following principles and instruments would contribute to densification policies that are more sustainable in this sense. They lead to an understanding of densification that considers it not only as an individual concern but also as an integrated process of neighbourhood development of single-family home areas. We will present two principles that should be integrated into such a form of densification policies. The first one is related more to the experience of loss of intimacy, the second one to the experience of loss of the idyllic character of the district.

The first principle aims at the introduction of a respectful attitude in the policies of densification towards those inhabitants who are living directly next to a densification project. This should be realised by taking them into consideration in the application for a building permit, an obligation that to a large extent does not exist in the legal framework of the countries of our case studies. The application for a building permit should contain a part that focuses on the dwelling sides of the immediate neighbours, and elaborates how the densification project takes them into account and intends to minimize the impact on them. The obligation of the densifier to inform the direct neighbours of the densified plot about the densification project is a further element of a respectful densification policy. The experience of the German case study, where there is an obligation to inform the owner of the plots that are in the direct vicinity of the densified plot, shows that the contact between densifier and neighbours can lead to small ad-



Fig 26: Starting point (left) of a simulation in Waldtrudering and some architectural elements (right) to be used in the simulation (source: Kazig, Paris & Simone 2016)

justments of the densification project and improve the project from the neighbours' point of view. The combination of both obligations would contribute to a legal framework that leads densifiers to take into consideration the concerns of the neighbours without imposing too onerous burdens that would inhibit the process of densification of single-family home areas.

The aim of the second principle is to conserve the idyllic character of the neighbourhood in spite of an ongoing densification. The proposition is to develop, with the participation of the existing inhabitants, design guidelines for the development of neighbourhoods that are supposed to go through a numerically significant process of densification. In our project, we tested a tablet-based simulation tool (Renk & Simone 2012) that allows the inhabitants to simulate densification projects that would be acceptable to them. The tool consists of a view of a plot where densification is to take place, and the surrounding urban landscape of this plot that is representative for the neighbourhood (figure 26).

The users of the tool can use a set of architectural and landscape elements in order to simulate a densification of the plot that they consider to be acceptable. After finishing the simulation, the participants were asked to present the results of their simulations to each other and discuss them. This kind of tool could be used to organise inhabitants' participation, in order to elaborate design guidelines for the densification of the neighbourhood. The testing of the tool in our case studies taught us that it is a helpful instrument to work out those characteristics of the neighbourhood that are valued by the existing inhabitants as a kind of ordinary heritage, and to determinate forms of densification that are unacceptable to them because they are considered to cause the character of the neighbourhood to deteriorate. These two categories of simulation results should be used as input for the development of design guidelines for the neighbourhood that describe possible forms of densification that allow shared everyday aesthetic qualities of the district to be preserved.

Both principles that we presented here can be seen as a step towards a new understanding of the development of single family-home areas that takes into consideration their specific urban and landscape qualities and contributes to an integrated development of these areas.

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Session 6:

Governance and strategy

Managing Inactivity. New strategies for the detached house in Lombardy

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Introduction

Detached family houses, built from the 60s to the 90s, spread around the towns in Northern Italy, covering disorderly a large part of the land. The settlements form disappeared and, together with it, the possibility to recognise the territorial structure. In particular, in Lombardy this phenomenon affects the whole region, representing the most diffused kind of built environment. The repetition of the detached house model was not able to create new communities connected to previous settlements. Now the ageing of the owners, the lack of local services and isolation are gradually bringing these buildings to abandon and under-use, raising some questions about their future.

The issue of managing the phenomenon of shrinking in the extensively built city affects also other countries, which are facing similar social and economic changes. A characteristic that combines these different territories, namely Great Britain, France, Germany and Japan, is to have been important industrial areas since the end of WWII or even before. Starting from the 80s-90s, the increasing growth of the tertiary sector strongly influenced further territorial development, while social structure remained stable. In the last ten years, changes have emerged on all levels and the need of a new planning approach has become urgent. Depending on history, territorial structure and social background, different strategies were proposed, as top-down process-

es led by municipalities or state commission as well as bottom-up processes supported by local groups, charities and cooperatives (see comparable cases references). Nevertheless, by now none of them has been extensively used as an effective answer to stop abandon and under-use problems.

Northern Italy and the Lombardy case

Looking at the enormous dispersion that characterises big areas of the northern Italian territory and trying to retrace the history of these places, is important to consider that the territorial structure largely changed during the second part of the 20th century. This evolution was the result of many individual interventions driven by a collective entity, the state. Unlike it was in the past, the cities expanded in increasingly wider and less densely used spaces. Changes had an impact on hierarchies as well, disrupting old patterns and creating new hybrid combinations of production, residential, consumption and free time spaces. Regarding the forms of living spaces, in particular, they widely changed and so did the behaviours of the users of this territory. That led up to a high use of national resources and of family savings and to an inefficient result (Clementi, Dematteis & Palermo 1996). The Po region presents itself now as one of the biggest conurbations in the Mediterranean area: a continuous urban context covers three regions unified by the pre-Alps line.



Fig 27: Built-up areas in the Pedemontana Lombarda territory (source: OpenStreetMap 2017, ODbL)

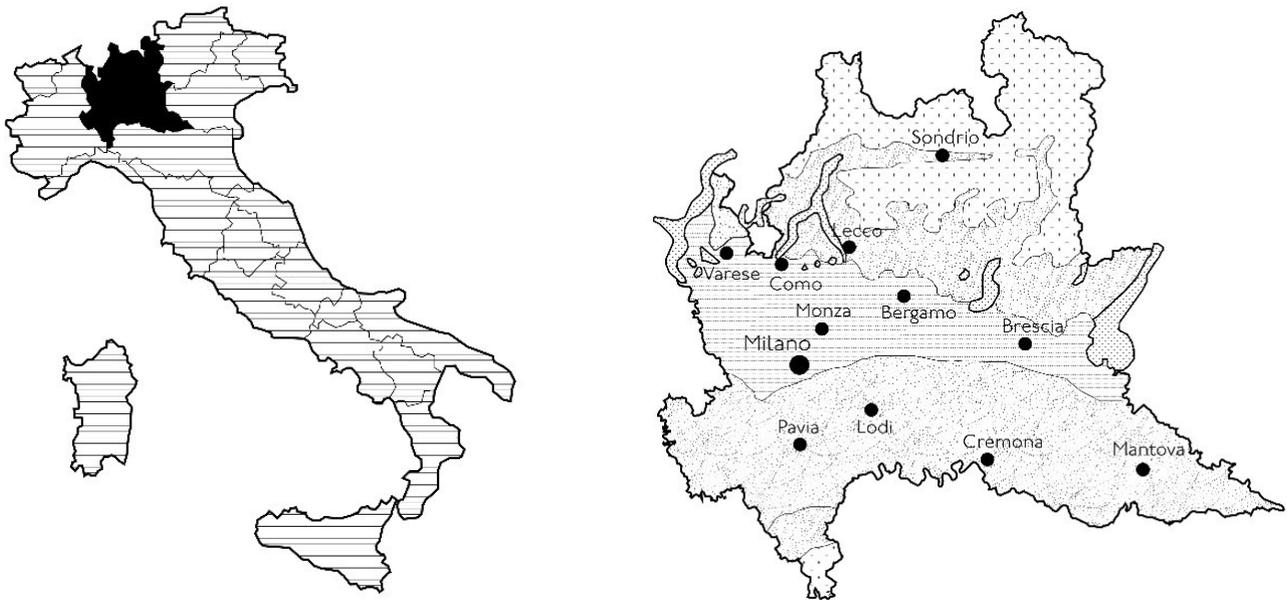


Fig 28: Italy and Lombardy (source: Pigni)

It can be generally said that a net of middle-sized cities, connected by a widespread infrastructural system and surrounded by a big number of towns aligned on the main streets, characterises the territory of Lombardy. Anyway, starting from the late 70s, the population has begun to redistribute from the cities to the territory, changing the aspect and the structure of the suburbs. The residential building stock in the hinterland is big and pervasively widespread: 70% of the regional building stock concentrates in the northern part of the region, the area between Varese and Brescia. Consequently, the territory has grown unbalanced and contradictory (Boeri, Lanzani & Marini 1993). The lack of a clear unifying plan has provoked the lack of right connections between the society and the space with

and in which it interacts: the territorial facilities do not effectively match people's practices.

As far as social aspects are concerned, the most evident change that occurred is the fragmentation of family structures. Nowadays the average number of family members is 2.32, when in 1977 it was 3.2. Therefore, personal expectations of family members has become more and more important. The strongest element of continuity between individuals and the territory remains the relationship with the house (Munarin & Tosi 2001). The building itself represents the fixed capital of families and it stands for economic development. In spite of the recent crisis, the house remains a very important part of family life. However, houses no longer seem malleable in order to grow and change with fam-

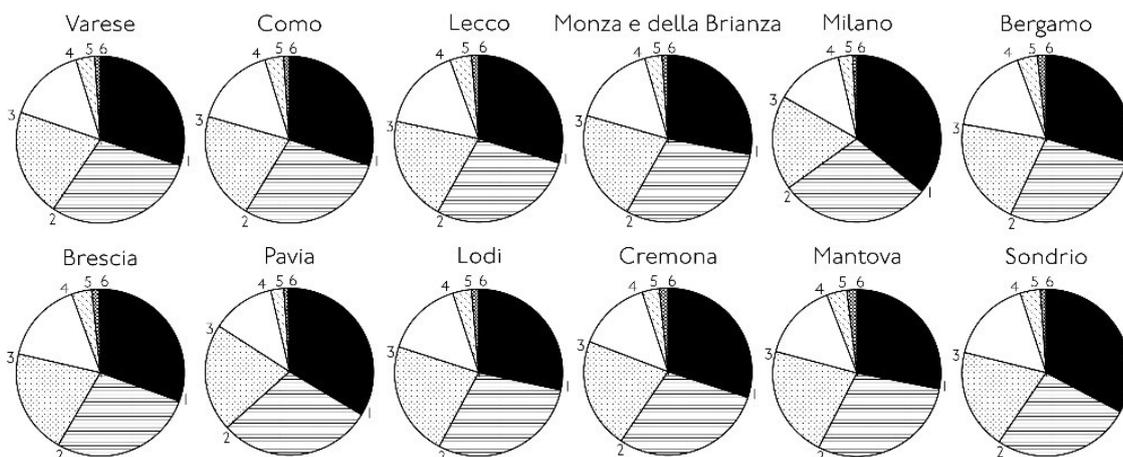


Fig 29: Italy and Lombardy (source: Istat)



Fig 30: A detached house provinces and a street in Lurate Caccivio (source: Pigni)

ilies. Together with this, the operating costs exceed the savings capacity of households, often an elderly living alone. An increasingly frequent process of abandonment of detached houses is underway. It generally starts from some rooms and gradually spreads to the entire house (Merlini & Zanfi 2014). It is also difficult to imagine putting this typology back on the market, because of its costs, stiffness and desuetude. The detached house urgently requires a reinvention in role and shape and an adjustment for a changed society through a sustainable process of reuse and recycling.

Lurate Caccivio: case study and approach

The municipality of Lurate Caccivio, located between Varese and Como, has been chosen as case study because it is both a representative and a peculiar example at the same time. It is defined by a built environment composed of single- or two-family detached houses, located in the middle of small parcels or along the streets. Small factories and houses alternate homogeneously or even share the same plot, as happens in many municipalities in this area. However, Lurate Caccivio also had a particular development. From the 60s to the 80s, its population doubled and new buildings, mainly detached houses, connected the two old centres, which were the original settlements. They cover more than the 40% of the total number of dwellings. The construction boom of three decades completely changed the aspect of two villages and the lifestyle of their inhabitants. Now the growth has reached zero values and the town, however dynamic it may be, is involved in the territorial shrinkage of population. Inhabitants are gradually decreasing and getting older. In 2011, 20% of the inhabitants were 65 or over. The

percentage of single-person families is nowadays 20% and, together with two-person-families, they reach the value of 56.5%. Big detached houses are not suitable for elderly people and young inhabitants are more interested in collective housing models, not isolated and with more services. Furthermore, 70% of the housing stock on the market dates back to the 80s or earlier and it is impossible to sell the house at the same initial price. Detached houses are in a “limbo” condition: they are too expensive to be maintained by the owners, but too important for them to let prices go down.



Fig 31: Map of Lurate Caccivio (source: Pigni)

Looking at the open space, rare squares, mainly used as parking lots, are insufficient in order to be proper gathering places for a middle-sized town. Some gardens are placed near public facilities, but they remain underused because of the scarce connectivity with the built environment. Therefore, streets appear as the main public space, even if they are mostly used for car circulation. The lack of uniform planning policies led up to the construction of a confused and not hierarchical street system. The actual street structure is both an infrastructural and a social issue. The system is very expensive to maintain and the diffuse neglect separates the inhabitants from the open space even more, making all the public activities concentrate in enclosed areas or inside buildings. The detachment between society and built environment is an increasingly strong phenomenon that must be contained in order to rebuild the town community sense.

Tools and Strategies

Interviews have been chosen as the method of approach to understand how the built environment is really perceived and lived. A set of both territorial potentiality and weakness emerges from the observation of

the current situation. Only by leveraging on these aspects and finding their flexibilities, can strategies have a commensurate basis to answer the actual problems. In fact, in order to revitalise a shrinking territory, solutions must necessarily come from the inside (Magnaghi 2010). Necessary tools are already in place, while what is missing is their selection and systematisation. Inhabitants' opinions were divided into three groups of themes: values, limits and influences. Values are defined as positive elements broadly divided into two topics, family and privacy. Limits are negative elements that challenge residents' motivations, namely high operating costs and the spatial and bureaucratic stiffness. Influences are defined as those aspects that suddenly emerged in the post-war period, as having big house spaces and a decorative garden.

Together with these elements, inhabitants have difficulties in accepting that managing a detached house nowadays needs capabilities that were not required before. This built environment, privately owned and managed, is claiming external intervention, which should mitigate this burden. The public authority has the opportunity to trigger a series of procedures that should start to regenerate the social and territorial structure. In order to

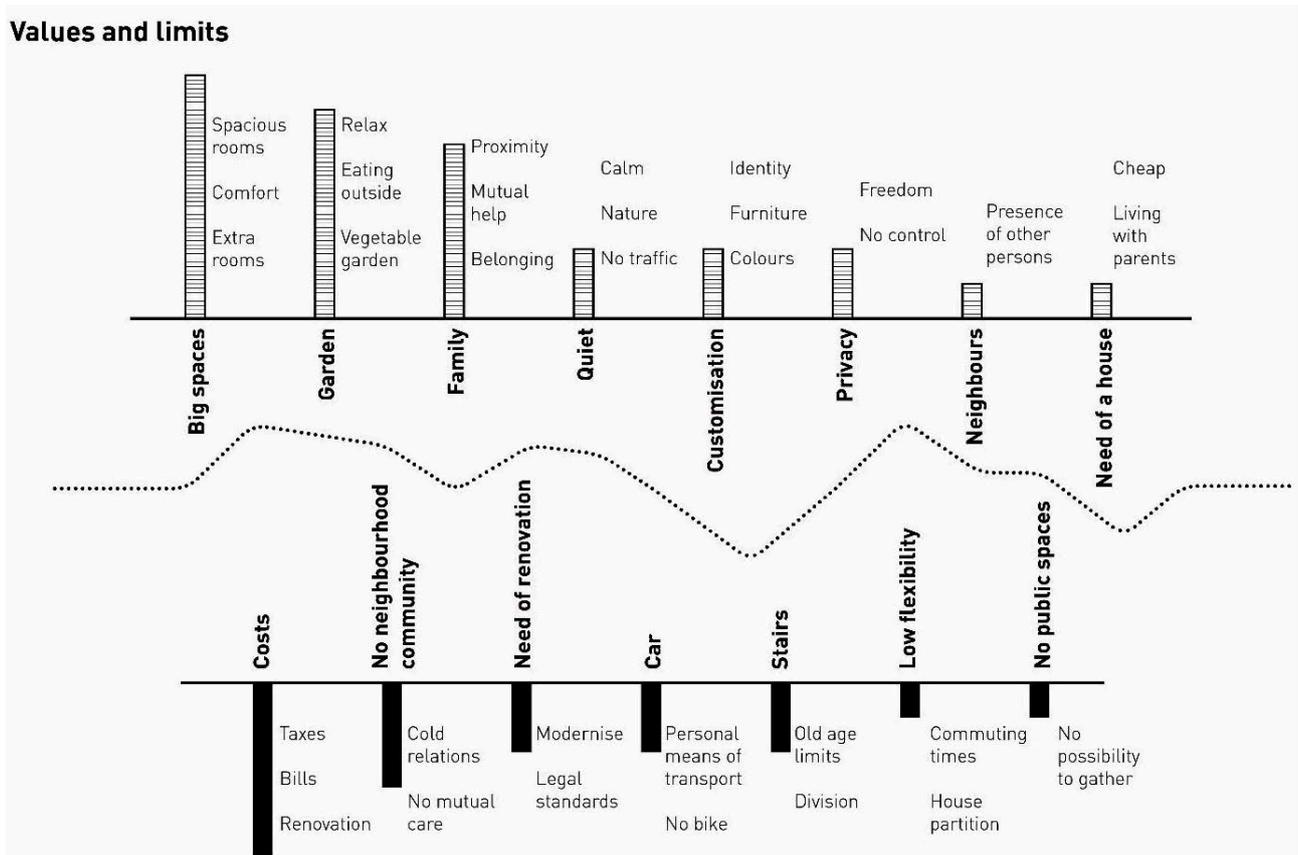


Fig 32: Values and limits (source: Pigni)

do that, it is possible to imagine two sets of strategies, divided according to the time and the scale of their impact.

The first ones are micro strategies, which aim to answer the current emergencies, as the lack of affordable housing, the rising underuse of detached houses and the neglect of public spaces. They are proposed as pilot projects that concentrate on some specific cases.

- House redevelopment for social housing projects: the need of an affordable house is becoming an urgent problem for many. At the same time, there is a big number of houses that are not used and are not rented out. Matching these vacant spaces with families in need can be done through the development of network activities and the mediation of a no-profit organization.
- House redevelopment for community spaces: inhabitants are satisfied with their houses, but they miss the community sense. In addition, the burden of maintenance costs is getting heavier. Community facilities can be realised in the extra-rooms and spaces with little modifications, thanks to the mitigation of taxes and an easier bureaucratic process.
- Public space strategies: towns are generally suffering a lack of functioning public space. Squares and green areas suffer from under maintenance. Through the combined work of municipality and inhabitants, it is possible to imagine a better use of these spaces.

The macro strategies are planned to last longer, in order to direct the development of a different built environment. They are based on past launched projects and carry out the highlighted proposals extensively.

- Old town centre renovation: the old town centres are suffering a big lack of maintenance and care. The courtyard house typology, which hosted many generations of families and different uses, offers both a communal way of living and a protected space. The renovation of these buildings can bring advantages also to the community, re-establishing the vitality of the centre.
- Denser built environment: to offer a space that is more functional and allows interactions, the social and the built up density need to be improved. The management of the current detached houses stock through minute projects of “intelligent refurbishment” and “upgrading” can be combined with the

construction of new buildings in specific parcels close to the town centre.

- Infrastructure sustainability: denser typologies allow the municipal administration to concentrate maintenance works on a smaller area of the town territory. At the same time, with the gradual rarefaction of the outer part of the municipality, no more used infrastructures are going to be dismantled.

Outlooks

In the last 15 years, the interest in the detached house issue within the extensively built city context has considerably increased. Anyway, without a test of realization, it is quite impossible to understand the economic feasibility and the environmental sustainability of these processes. A push towards the actualisation of the proposals at least at the neighbourhood scale is absolutely needed. Moreover, the topic of the civic participation in the extensively built city context is not currently being widely debated. To establish a connection with the inhabitants and to deepen the knowledge about community projects has also been the attempt of this study, which has approached detached houses “from the inside”. Pilot projects must start focusing on the built environment in its relationship with the local social substratum. In this way, a new identity can be awakened by the introduction of a solid key element that could reinforce the sense of belonging to both social and built environment.

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New challenges for old neighbourhoods. Single-family houses in an ageing society

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In the future, demographic change will have an ever-increasing impact on society. In particular neighbourhoods with single-family houses built between the 1950s and the 1980s virtually experience a 'double ageing process': The houses have 'matured' and so have their inhabitants, who as young families once realised their dream of their 'own home', who have aged almost collectively, and who have to decide next whether they can and want to stay in their 'own four walls'.

According to settlement and urban development, neighbourhoods with single-family houses for the first time will lose their attractiveness and population in some parts of Europe with the ongoing trend of reurbanisation, a stagnating or rather declining number of inhabitants and an increasing ageing population (Zakrzewski 2011). Furthermore, Swiss neighbourhoods with single-family houses constitute a significant potential for structural compression in the face of a sustained demand for housing and the political call for holding back suburban sprawl (Metron 2011; Bosshard et al. 2014).

The paper shows strategies in architectural and urban planning for neighbourhoods with single-family houses with regard to an aging society. Results of the research project *Home and Identity in Ageing Neighbourhoods with Single-family Houses*, which is part of the *Strategic Initiative Ageing* of the University of Applied Sciences and Arts Northwestern Switzerland, are being integrated for this purpose. In this project the *School of Architecture, Civil Engineering and Geomatics* and the *School of Social Work* connect a basic research-oriented, sociological question with a directly applied planning approach in an interdisciplinary manner. The aim is to develop and test architectural and urbanistic strategies which enable older inhabitants to stay in their neighbourhood.

The specific value of a neighbourhood as a structurally grown but continuously changing context and a space for social relations for older inhabitants is investigated in the case of two Swiss neighbourhoods with single-family houses. Not only architectural and urbanistic structures of the investigated space are analysed. Through qualitative interviews the perspective of older inhabitants is reconstructed, too. The variants are then discussed with respective local experts.

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Governance approaches to adaptation and stabilization of single-family house areas

Theo Kötter, Dominik Weiß, University of Bonn, Germany

Summary of Analysis

In a much greater extent than other neighbourhoods, the suburban single-family house areas will undergo demographic, economic and physical transformation processes. Due to the respective conditions and developments of the regional and urban spatial location, of the population and the building structure, different town planning actions and management requirements can be derived (Kötter 2013). Based on four selected types of housing areas with specific development paths a quite complex spectrum of development strategies for single-family house areas are being discussed.

The urban transformation and structural adaptation of single-family house areas in Germany is a relatively new field of urban research. Especially from a demographic perspective the economic stability and sustainability of this segment is questioned (Aring 2012; Zakrewski 2011). Effects of filtering processes, fluctuation and vacancy, the change of generation within these areas and changing needs and lifestyles of the target group of young families have been addressed (Kötter & Schollän 2010; Kötter 2014; De Temple 2005). In some case studies, specific urban and infrastructural adaptation options were identified and evaluated (Wüstenrot 2012; ILS 2012). It turns out that the various strategic options and instruments that have been discussed

should be embedded in municipal governance structures. After the original planning and development family house areas were mostly left to themselves and planners need to find approaches to how to deal with potential problems. Especially dealing with the vast number of property owners with different interests is a new challenge for urban planners. Transferring previous experiences of urban regeneration of city-centers and dense early/inner ring of urban expansion to this new challenge is limited. Designing an integrated action strategy implies initially to identify and to prioritize the specific problems and needs for action. Similar to change management processes realistic goals and effective policies have to be prepared.

Managing transformation usually start with the identification of shortcomings in the urban development by expert analysis. These insights and results have to be recognized by politicians and communicated to the inhabitants and other actors.

Upcoming transformation processes in the older single family home areas can be described and analyzed in two dimensions:

1. The spatial component describes the variety of supply and demand in terms of demographic and socioeconomic trends on the regional level. This has been done for the federal state of North Rhine Westfalia by a statistical cluster analysis.

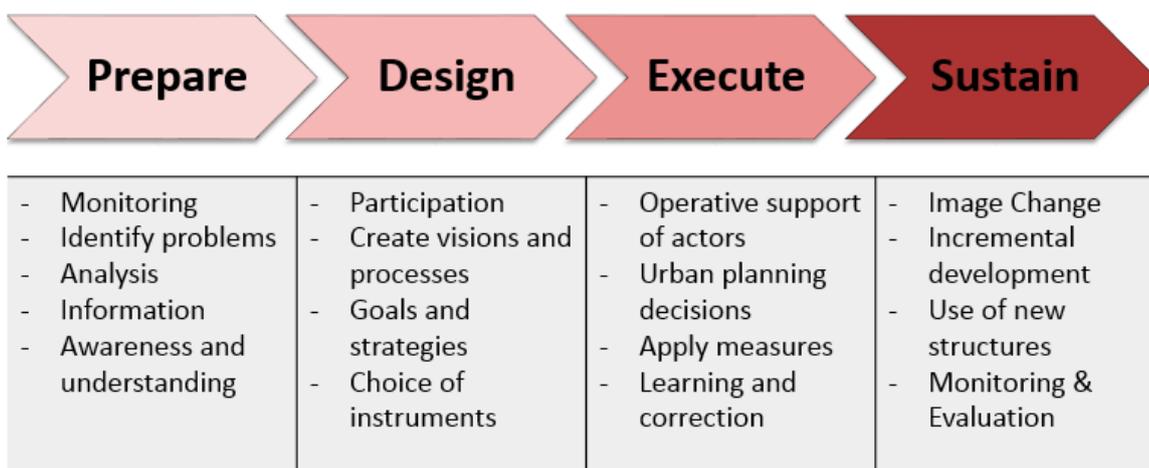


Fig 33: Change Management of urban transformation processes (source: Kötter, Weiß)

2. Apart from that different social processes that are changing dynamically de-terminate the challenges and priorities and options for older single family house areas on the neighbourhood level.

From this analysis starts a scenario based approach to develop appropriate strategies for typical areas with different needs for action are developed. This selection displays the variety of challenges and characteristics but does not claim that all family house areas can be assigned to these groups. Rather, it is a typological and therefore generalizing approach to reveal the structurally different problems and opportunities (Kötter 2014). The four scenarios take into account the location and age of the single-family house area, as well as the demographic and social structures, the infrastructural facilities and processes on the housing market:

- Scenario 1 “Migration and Vacancies in rural areas”
- Scenario 2 “Filtering Down and social transformation of suburbia”
- Scenario 3 “Demographic change and infrastructural mismatch”
- Scenario 4 “Redevelopment by densification and infill development in the conurbation”

Policy Implications

The scenarios comprise a variety of problems and show that the transformation and adaptation of single-family house areas will be a future challenge for urban planning. To push forward the processes, that are not self-perpetuating it requires multistage strategies under the auspices of local authorities.

A governance process with adequate control and implementation instruments must be developed and established. Finally, the participation of all relevant actors and stakeholders like inhabitants and owners is crucial. With this background of sound concepts, instruments and actor participation the application of measures and sustainable changes will be promising.

A comprehensive overview describes a set of approved tools, administrative, fiscal, cooperative and legal instruments of integrated urban development. Their applicability and potential contribution to the strategies that have been derived from the described scenarios will be evaluated.

It is a first step of an extendible toolbox that planners should have in mind for the transformation of single

family house areas. With more experience in this field cities will learn which instruments are applicable to which scenario. Important is the combination to an integrated strategy, because it will rarely be the case that in a city occur only areas of one scenario type.

However, strategies and concepts must be customized according to the problems and needs for action in each case. Recommendable are integrative approaches based on careful analysis, monitoring and assessments of the local situation. The bunch of measures and interventions should include sovereign, cooperative and fiscal instruments. Participation of the inhabitants and other actors and stakeholders is important. Goals and measures, which are consensus in the majority of those involved, are most promising in such transformation processes.

Furthermore, for transformation processes in single-family house areas do not exist any blueprints. This field of action is too new and with respect to the variety of problems, different options and local specific details of every case it must be stated that there are many ways of transformation ahead. Coordinated actions and initiatives between planners, owners, inhabitants and further actors require a common perception of the problem.

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Session 7:

Land use and valuation

Putting value for single-family homes – a talk of valuation approaches in the era of open data

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Background

In the field of real estate valuation single-family homes (houses) represent a challenge for the real estate valuer. Especially single-family homes are having more or less – usually more – an individual nature. Hereby Market approach (IVS 2013), which idea is to exploit data of comparative sales has some challenges by default. It is hard to use the data of comparative sales, if there isn't really comparable transactions. Secondly, single family houses are not so often objects in the rental market, at least in Finland (like flats are). So, it is hard to find price information on rental prices and ground the valuation on the Income approach (IVS 2013). Third possibility to find a market value is approach which is based on the idea that value is a function of the construction (replacement) cost. This approach isn't usually applicable to apply for a land valuation so it alone doesn't provide a holistic approach which is usually required when valuing single family houses.

Thus a practical solution for valuing single-family houses is the combination of the aforementioned methods. Especially in the Finnish housing market a dominant method of professional real estate valuers is to apply Cost approach for valuing the building. This approach requires taking account the depreciation cost of aged buildings. For the land valuation Market approach is applied.

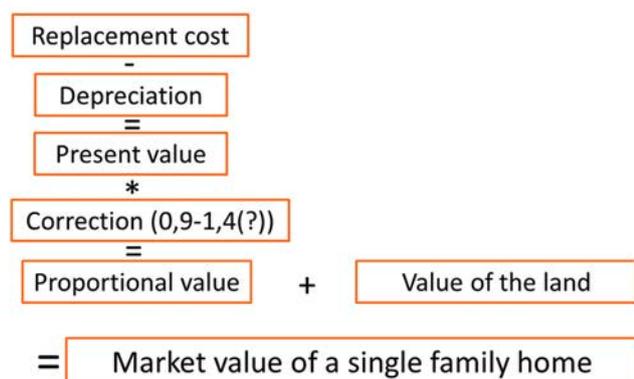


Fig 34: Valuation practice of single family houses according to traditional Finnish approach (source: based on the work Halomo & Koskenvesa 1995)

In this research construction of a price model for single-family house is under study. Challenge is going to be tackled by using open data sources. Exact research question is stated as follows: However, the market value of a single-family house is rarely the sum of the building value and land value directly, as such. Value adjustment is required but usually this involves a small scale study to determine the correct value adjustment factor (correction). So applicability of this so called Sum approach in practice is questionable.

In this research construction of a price model for single-family house is under study. Challenge is going to be tackled by using open data sources. Exact research question is stated as follows:

RQ: *What is the quality of a price model for single-family house valuation purposes using only publicly available data?*

This research has a country specific nature and it is focusing on Finland and especially on the Helsinki metropolitan area. The methodology itself has anyway a universal applicability since the method exploited here is nothing else than the multiple linear regression analysis (MLR).

Hereby, theoretical background lies in the hedonic price modelling. In this short conference style paper theory of hedonic prices is not anyway refereed.

In the next chapter goal is to explain the nature of the chosen case and way how MLR is applied especially in this study. In chapter three results of estimations are gone through and in final chapter four discussion takes place and conclusions are stated.

Methodology

Helsinki metropolitan area (HMA) is usually seen to cover the city of Helsinki (capital of Finland) (628208) and the neighbouring cities of Espoo (269802) and Vantaa (214605) plus a small city of Kauniainen (9486) which is geographically located inside the city of Espoo. Figure in parenthesis is the number of population by 31.12.2015 according to Statistics Finland.

HMA is the biggest urban area in Finland and main driver of the economic growth. House prices have been in the area somewhat stable during the recent year despite the fact that population is constantly moving to the area from the countryside. Price level of houses in the area is essentially higher than elsewhere in Finland. By selecting HMA as a case area means that relatively big amount of transaction data can be found. However, the number of single-family homes transactions is somewhat small related to the number of flat transactions. There is no special reason why HMA was chosen as a case area, but in coming studies there could be a study layout where number of flat transactions is not so dominating in the case area.

Open data service <http://asuntojen.hintatiedot.fi>

Model development was based on data service called <http://asuntojen.hintatiedot.fi>. App. 5000 price observations were available covering the last 12 months (3/2016-4/2015). The service doesn't provide an exact location and exact date of transaction. So, there is an obvious source of biased information since the possible price level along the time cannot be controlled in the model. On the other hand, like mentioned, the price level has been somewhat even already years in the case area, so the shortage is estimated to have a very minor effect. In the case area there are more than 100 ZIP-code areas altogether so there is anyway rough knowledge about the locations.

In the service there is an option to pick up the transactions by ZIP-code area criterion which was used this time. This gives an opportunity to enrich data by adding other ZIP-code based open data to the original transaction set. This data enrichment option wasn't used at this study anyway.

Data available in the service is originally gathered by the five biggest real estate brokers in the country. Thus private transactions weren't included at all, which is another possible source of biased sample as well. A rough estimation is that the sample represents somewhat

30 % of all transactions in the case area. Summary of the data can be seen from in next table 5.

Technical specification of the model

Transaction data in aforementioned open data service is basically type of the following structure.

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_j X_{ji} + \varepsilon_i$$

Hereby it can be easily seen that MLR can be applied in model construction. Variable to be explained Y can be price/m² or transaction price as a whole. So, in the method it is assumed that at least one of the independent variables X (like area) explains the dependent variable Y. Most probably there is anyway randomness in that relationship and term ε is needed to the model (usually called an error term). Purpose is to find values for the coefficients beta so that there is best fit to the data. In case of linear regression the best fit is usually judged based on the difference between real value of the observation and the calculated value. In practice this difference is calculated as a squared sum of errors (SSE). So task is to make the estimation so that SSE is minimized and more, the expected value of the error term, in the final model called residual e, is zero.

Independent variables X_n (like dependent variable DV as well) may be continuous or then so called dummy variables. Dummy variables are variables which may receive only values of 1 or 0. In practice this is the way to include the qualitative features of the observations into the model as well, like existence of a sauna. Dummy variables coded into the comparable sales are as follows.

City-dummies

- DHelsinki, DEspoo, DVantaa, DKauniainen (REF. level)

Condition dummies

- DconditionGOOD, DconditionSATISFACTORY (REF. level), DconditionPOOR

Roomno dummies

- D1ROOM, D2ROOMs, D3ROOMs, D4+ROOMs (REF. level)

Tab 4: Transaction data according to type of real estate and locating city (source: Laitala)

	Helsinki	Espoo	Vantaa	Kauniainen	=
Flats	2 656	645	516	32	3 849
Row-houses	330	387	203	12	932
Single-family homes	80	93	79	6	258
=	3 066	1 125	798	50	5 039

Tab 5: Results of the second estimation (SPSS table). Adj. R2 is 87,1 %.
Only lowest and largest ZIP-code values are included into the table (200=00200 and 410=00410) (source: Laitala)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
75	(Constant)	12,356	0,042		293,292	0,000
	Area	0,004	0,000	0,490	28,787	0,000
	D_Vantaa	-0,425	0,033	-0,502	-12,708	0,000
	Dcondgood	0,105	0,010	0,130	10,104	0,000
	D2rooms	-0,169	0,016	-0,138	-10,439	0,000
	200	1,139	0,096	0,130	11,839	0,000
	1970-1979	-0,060	0,013	-0,057	-4,681	0,000
	2010-2014	0,263	0,017	0,191	15,406	0,000
	2000-2009	0,171	0,013	0,175	13,176	0,000
	2015-	0,228	0,020	0,176	11,457	0,000
	Dcondpoor	-0,152	0,028	-0,062	-5,393	0,000
	1990-1999	0,084	0,013	0,078	6,262	0,000
	D_Espoo	-0,216	0,033	-0,287	-6,583	0,000
	1900-1909	-0,569	0,133	-0,046	-4,289	0,000
	D1room	-0,229	0,045	-0,058	-5,086	0,000
	D3rooms	-0,048	0,010	-0,059	-4,670	0,000
	D_Helsinki	-0,225	0,033	-0,296	-6,744	0,000
	D_RowHouse	-0,080	0,012	-0,092	-6,520	0,000
	1950-1959	-0,089	0,025	-0,046	-3,545	0,000
	1930-1939	-0,189	0,068	-0,034	-2,782	0,005
	410	-0,234	0,093	-0,027	-2,511	0,012
	1940-1949	-0,088	0,042	-0,026	-2,087	0,037
	Dsauna	0,021	0,010	0,025	2,126	0,034
a Dependent Variable: LnPrice						

Area (continuous)

Age and Age-dummies

- First continuous, then coded in model 2 as dummies (decade dummies)

Notation “REF. level” in the end of some dummy variables refers to the dummy which is chosen as a reference level. In the calculation phase it is the variable which is not given to the model. If other corresponding dummies enter the final model and their beta is thus receiving a value, this value is then the difference to the reference level.

Finally a separate dummy variable DSAUNA is included to the model. In this case and in Finnish data in general the existence of sauna has a meaning of private (own) sauna – inside the house or apartment. In row houses or multi-flat houses there are very usually a joint (com-

mon) sauna but it is not taken account when coding a sauna dummy.

In the calculations IBM SPSS Statistics version 23 was used and in both models the algorithm Stepwise was applied. Stepwise is so called stepping method which adds variables one by one to the model according to strongest correlations among the non-added variable. This continues so far than the added variable bypasses the t-test. Roughly speaking this test reviews whether there is a statistical significance for the partial correlation between the newly added variable and DV. Most commonly used risk-level for this test is 0,05.

Stepwise also checks the possible multicollinearity problem after every round. Multikollinearity is a phenomenon where two or more IVs are correlating so strong

that they “explain each other”. This may result as wrong signs of the coefficients. At this kind of situations problematic outcomes may occur. For example a variable Distance (in minutes e.g.) may reach a positive sign giving an idea that apartments more far away from the city center are more valuable than the closer one even though this is not necessarily the case within the data.

Stepwise may also remove variables from the model if a new variable added to the model reduces the statistical significance in t-tests of the earlier added variable.

Results

First generated model was just a relatively simple test to try Price/m² as a dependent variable. Results are somewhat expected. Adjusted R² rises up to 68,5 % giving a good start for further estimations. Main problem with the model relevancy is somewhat strong heteroskedasticity. In this particular case; when values of dependent variable increases the number of positive residuals (and their magnitude) increases as well. Hereby, based on graphical interpretation, residuals seem to have clear positive correlation. Practically this means that model is unable to explain higher values for Price/m² and gives underestimated results.

Most probably this is because the DV isn't normally distributed and positive skewness takes place. Normality of the DV isn't separately checked in the beginning but this is the case of price/m² as a dependent variable usually. Hereby standard solution – natural log transformation of DV – is done for the model 2.

Normality of the continuous variables is a standard assumption in MLR estimation. Age of the buildings relatively often represent a modelling challenge. In this study when age of the buildings is compared against DV there is a slight non-linearity problem even after the log transformation of DV is carried out. Most probably this is because the variable age captures other features than technical and economic ageing alone. Age is possible a proxy (substituent) for things like renovations, decorations, room height and architectural style. And if variable energy efficiency is missing Age may capture this effect as well. Hereby, in further estimations in this paper, variable age is coded as a dummy variable. Decade dummies are according to calendar decades, D1920-1929 e.g. Age dummy D1980-D1989 which represents most of the cases is chosen to a reference value. New construction is chosen as its own category

covering the construction year 2015 and the beginning of 2016 (D2015-). So, continuous variable Age will be replaced by age dummies in model two.

One specialty in models 1 and 2 is that there are two types of regional – location capturing – dummy variables: ZIP-codes and city-dummies. One may expect that city dummies are excluded from the model and ZIP-code dummies would explain all location based features but this doesn't seem to be the case. Reference level of city dummies is a small municipality called Kauniainen and all the other city-dummies are having quite a strong and statistically relevance effect already in the model one. So, results of the second estimation round are presented in the table below.

Model two includes real estate types of single-family homes and row-houses like model 1 as well and size of a sample is consequently still 932+258=1190. Value of the coefficient for the variable D_RowHouse -0,080 shows that value of the row-houses is app. 8 % lower than the value of the single family houses which was chosen as a reference level.

Next logical step would be the model 3 where flats are included into the model, but in this limited conference paper these further steps are excluded. It is already now possible to draw some conclusions.

Discussion and conclusions

Based on the results it seems that relatively high quality MLR models can be estimated by exploiting the open data service <http://asuntojen.hintatiedot.fi>. Rate of determination rises close to 90 % without severe heteroscedasticity or any other major problem.

However some robustness checks should be carried out. One of them is a possible existence of spatial autocorrelation. Main interest in that analysis is to find out whether the spatial distribution of residuals have a pattern or not. If the pattern can be seen (in a map for instance) it indicates that model is not working properly in all areas. One way to examine the spatial autocorrelation is to calculate Moran's Index but it's not carried out here.

By continuing the technical analysis of the model it is clear that some more shortages can be found out. One of them is lack of variables. For example it is not known what is the size of the land area in single family home transactions and also the number of floors is missing information. Number of floors is partly provided in the

mentioned open data service but there seems to be so much missing information that it is excluded from the models. Hereby values of the single coefficients are not right. Coefficients represent the value of so called implicit prices or shadow prices. Hereby separated effects (single coefficients) are not correct, like value of sauna.

Some problems are explained already in the methodology section like exact date of the transactions. Despite these problems, it has to be said, that estimated model 2 provides relatively satisfactory results. Explanation rate is remarkably high. And taking account that by somewhat small effort is needed to model the whole case area, the HMA market!

MLR analysis is nowadays taught quite widely and it seems that enough open data is available for the meaningful modelling purposes. Person who is familiar with the MLR and have some experience working with data cleansing and variable coding may be able to establish a relevant model only in some hours. This kind of modelling may have a real effect in the near future of housing market.

Taking account especially deficiencies of the model construction several suggestions for further research can be done. First, locational dummy structure should be changed. Now there are “empty” ZIP-code areas where any transactions haven’t taken place. In valuation practice the established model cannot be used in case the object under valuation locates the area where no transaction data hasn’t been available. This leads to the situation where combination of two or more ZIP areas are performed so that “empty” areas will be included one of the bigger entities. In practice this is hypothesized to decrease the Adj. R^2 when locations become less accurate.

As an important part of the finalizing this kind of study the developed model should be tested with real transactions. One way to do this easily would be excluding part of the data from the model and use it as a validation.

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1st Homes up International Conference on Single-Family Homes under Pressure?

Mannheim, October 13 - 14, 2016

Conference venue: ZEW, L 7, 1, 68161 Mannheim

P R O G R A M M E

Thursday, October 13, 2016

Conference Day 1 – Room Brussels

08:30 – 09:00	Registration
09:00 – 09:15	Welcome & Introduction to the topic Clemens Deilmann, Leibniz Institute of Ecological Urban and Regional Development – IOER Oliver Lerbs, Centre for European Economic Research – ZEW
09:15 – 09:45 Room Brussels	Presentation Homes-uP Project The future of single-family homes: an interdisciplinary investigation of challenges affecting single-family homes in Germany Clemens Deilmann, Leibniz Institute of Ecological Urban and Regional Development – IOER
09:45 – 10:45	Session 1: Cultural and structural classification <i>Chair: Andrea Berndgen-Kaiser, ILS</i> Tuning Residential Subdivision Rhythms O. Devisch and B. Roosen, Hasselt University Analysing and assessing the utilization of single-family homes in a suburban context – A multi-temporal approach applied to the city-region of Karlsruhe, Germany M. Jehling, Karlsruhe Institute of Technology
10:45 – 11:00	Coffee Break
11:00 – 12:00	Session 2: Sustainability and resources <i>Chair: Maja Lorbek, IOER</i> Questioning the Single-Family Home N. Heller, Münster University of Applied Sciences and K. Wagenknecht, University of Münster How ‘Green’ or ‘Grey’ Should Cities Be? Lessons From The Residential Land Use Footprint Of The Rich M. N. Daams and F. J. Sijtsma, University of Groningen
12:00 – 13:00	Lunch
13:00 – 13:45	Keynote Lecture Christine Whitehead, London School of Economics



13:45 – 14:45	<p>Session 3: Actors and stakeholders <i>Chair: Esther Schietinger, Institute for Social-Ecological Research - ISOE</i></p> <p>Three families for three homes - Trajectories and fates of single-family homes in informal Rome A. Coppola, Politecnico di Milano</p> <p>Single-Family Homes - There's life in the old dog yet! I. Tintemann, RWTH Aachen</p>
14:45 – 15:15	Coffee Break
15:15 – 16:15	<p>Session 4: Valuation and market impacts <i>Chair: Oliver Lerbs, Centre for European Research - ZEW</i></p> <p>Understanding Age-related Housing Depreciation: Inter- and Intra-regional Disparities in the Valuation of Single-Family Homes S. Gröbel, University of Münster</p> <p>Price decreases of single-family houses in Germany: Structure or location? W. Beimer and W. Maennig, University of Hamburg</p>
16:15 – 16:45	Announcements and closing remarks Conference Day 1
16:45	End of Conference Day 1
18:00	<p>Joint trip from Mannheim Main Station to Heidelberg Train departure: 18:07 h</p>
19:00	Dinner, Restaurant Sudpfanne, Heidelberg

 P R O G R A M M E

 Friday, October 14, 2016

Conference Day 2 – Room Brussels

09:00 – 10:00	<p>Session 5: Planning policy and spatial effects <i>Chair: Markus Wiechert, Research Institute for Regional and Urban Development – ILS</i></p> <p>Analytic Space Definition in the Single-Family Homes Maturation Discourse J. Polivka, TU Dortmund University</p> <p>Soft densification of single-family National home areas: morphologies, experiences and perspectives for the development of densification policies R. Kazig and M. Paris, Grenoble National School of Architecture</p>
10:00 – 10:15	Coffee Break
10:15 – 11:45	<p>Session 6: Governance and strategy <i>Chair: Markus Teske, ZEW</i></p> <p>Managing inactivity: New strategies for the detached house in Lombardy F. Pigni, ETH Zürich</p>



New challenges for old neighborhoods. Single-family houses in an ageing society.

H. Müller, University of Applied Sciences and Arts Northwestern Switzerland

Governance approaches to adaptation and stabilization of single-family house areas

T. Kötter and D. Weiß, University of Bonn

11:45 – 12:45

Lunch

12:45 – 13:45

Session 7: Land use and valuation

Chair: Lars Vandrei, ifo Institute for Economic Research Dresden Branch – ifo

Efficient Land Use with Congestion: Determining Land Values from Residential Rents

R. Füss and J. Koller, University of St.Gallen (cancelled)

Putting value for single-family homes –a talk of valuation approaches in the era of open data

A. Laitala, Aalto University

13:45 – 14:45

Panel Discussion Scientific Committee

14:45

End of Conference

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Leibniz Institute of Ecological Urban and Regional Development

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