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**When growth stresses development. Interdependencies between housing,
employment and mobility in the Munich metropolitan region**

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Abstract

The metropolitan region of Munich, Germany, is a telling example of how overall attractiveness puts increasing stress, not only on urban infrastructure, but also more particularly on the housing market. The limited supply of new housing – be it low-income, affordable or innovative housing – contrasts with an increasing demand from both within and outside the Greater Munich area. The resulting shortage of housing is thus increasing housing costs, with the now most expensive housing market in Germany standing as a barrier not only for the highly skilled labour force but for many other occupational segments of the labour market that power a knowledge-intensive 24-hour-city-region. As a consequence, high rents and the scarce availability of housing is leaving home-buyers with the alternatives of either: paying much more than expected for inner-city locations, or, choosing locations in the outer suburbs or more remote and affordable locations, which often lack accessibility and urban amenities.

Regional planning, on a basic level, accommodates individual choice of locations and municipal egoism in land-use strategies. Overall, the aggregate of individual choices leads to growing distances for residence-to-work commuting. On an inter-temporal perspective, supply of adequate infrastructure and amenities for everyday life lags increasing demand and thus remains insufficient. Which way

out – business as usual, transport oriented development or full internalization of external costs?

This research paper presents the first step of a mixed-methods research project, which investigates how employed persons – who are searching for housing – look for a workplace, select appropriate mobility infrastructure and optimise their choice behaviour. The research thus looks at spatial patterns of the search process when trading-off location choices for housing, jobs, as well as for modes and costs of mobility infrastructure. The study applies the following methods: (1) a conceptual causal model that explains the inter-dependencies between housing, jobs, and the use/costs of transportation on different spatial scales, by applying Frederic Vester's Sensitivity Model; (2) a GIS based 30-year longitudinal spatial analysis of housing, employment, and transport accessibility development patterns; (3) a web-based survey of households in the metropolitan region of Munich that have switched location of residence, job and transportation modes within the last three years. The expected outcome shall help to initiate a more strategic debate concerning sustainable poly-centric metropolitan development among key stakeholders in the private sector, the planning administration as well as with infrastructure providers.

Keywords: interdependencies of housing, employment, mobility; metropolitan region of Munich, housing market, labour market

1. Introduction

Spatial realities in large portions of Europe document the interdependencies of housing, employment and the use of different transportation modes (Priemus et al., 2001). Despite such realities, few integrated studies are available that would help both infrastructure and regional planners to wisely make use of land and financial resources.

Large-scale urban structures in Europe are a telling example of how overall attractiveness puts increasing stress, not only on urban infrastructure, but more particularly on the housing market. The case of the Munich Metropolitan Region shows how the limited supply of new housing – be it low-income, affordable or innovative housing – contrasts with increasing demand from within and from outside the Greater Munich area. The resulting shortage of housing is thus increasing housing costs with the now most expensive housing market in Germany standing as a barrier not only for the highly skilled labour force (Karel Willems, 2012), but for many other occupational segments of the labour market that keep running a knowledge-intensive 24-hour-city-region (Hafner et al., 2007).

As a consequence, high rents and the scarce availability of housing is leaving home-buyers with the alternatives of either: paying much more than expected for inner-city locations, or, choosing locations in the outer suburbs or more remote and affordable locations, which often lack accessibility and urban amenities. But why do we find such situations where fundamental spatial planning elements – specifically land-use, individual choice for residence, work place, transportation infrastructure, as well as the provision of these infrastructures – do not correspond with each other, but more so seem to produce a spatial mismatch?

Regional and supra-regional planning, on a basic level, accommodates individual choice of locations and municipal egoism in land-use strategies. Overall, the aggregate of individual choices leads to growing distances for both residence-to-work commuting and a sufficient supply of infrastructure and amenities for everyday life. Which way out – business as usual, transport oriented development or full internalization of external costs?

This research paper presents the first step of a mixed-methods research project, which investigates how employed persons who are searching for housing, look for a workplace, select appropriate mobility infrastructure and optimise their choice behaviour.

2. Conceptual background

2.1 The interdependence between residence and workplace

Is the job-housing balance our goal in urban development?

Many scholars advocate the 'job-housing balance' as a means of mitigating transport related problems, specifically for high commuting traffic demand and inefficient commuting mode choices (Levinson, 1998, Messenger and Ewing, 1996). Despite such advocacy, as to whether a job-housing balance can necessarily contribute to efficient commuting is still under discussion (Wachs et al., 1993, Peng, 1997). On the contrary, Miller and Ibrahim (1998) hold the differing opinion that location has a larger impact on commuting behavior compared to that of the job-housing balance. Moreover, considering the economies of agglomeration and actual household sizes, the job-housing balance is not realistic. This renders the separation between residence and workplace as being an unavoidable product of urban economic development. Alternatively, solutions should be further developed, which provide either transport infrastructure to connect centers of employment and housing, or, new housing areas along the public transport corridor connecting to job centers (Zheng and Sun, 2011).

Being close to one's employment location is not the only goal anymore.

One well developed residential location theory is the access-space trade off theory, based on classical utility maximization principles and the budget constraint assumption of neoclassical urban economics (Alonso, 1964, Muth, 1969, Fujita, 1989). According to this theory, job accessibility is considered to be one of the most dominant factors.

Alongside the access-space trade off theory, the status-quality trade off theory (Phe and Wakely, 2000) is also supplemented to better explain residential locations. This theory emphasizes not only the employment center as being essential, but also the other centers of cultural, economic and educational importance. In accordance with this theory, it can be seen that residential location decisions are not necessarily focused on minimizing commuting distances. Such was the case in a study on the Dallas-Fort Worth metropolitan area of the United States, which found that while 75% of households preferred to live close to their workplace, 25% of them preferred to live further away (Bhat and Guo, 2004).

Who came first, workplace or residence? Or are they jointly determined?

Most urban models have an underlying assumption that the workplace is exogenously defined, namely, jobs are chosen first whereby subsequent job changes can trigger residential relocation due to housing arrival rates being larger than those for jobs (Clark and Withers, 1999, van Ommeren et al., 2000). This underlying assumption is demonstrated by Xu et al. (2009) whereby it was found that residential areas followed job opportunities under the background of employment suburbanization in Beijing.

On the other hand, Steinnes (1977) highlights how causality actually runs from residence to employment and how employment location is more responsive to a residential location than the other way around, due to the high costs involved with residential moving (Siegel, 1975). Moreover nowadays, individuals' ties to their residences have become ever more stronger due to occupational uncertainty and the increasingly frequent changes in workplaces caused by the deregulation of labor markets and the increase in social mobility (Klammer and Tillmann, 2002). The empirical findings of Waddell et al. (2007) fall in line with those of Klammer and Tillmann (2002), in which it was demonstrated that 80% of surveyed households chose their residence first and later their workplace, based conditionally on the residence. In contrast with the findings of Xu et al. (2009), Levinson (1997) identified that the employment opportunities in the Washington D.C. Metropolitan area followed the suburbanization of new housing areas, thus maintaining the commute duration. Findings similar to these have also been documented for Catalonia, Spain (Romani et al., 2003).

Residential and workplace decisions taken by employed persons are closely correlated (Shi et al., 2013) and a household's ability to modify the situation of long-distance commuting via mutually co-locating residence and workplace was underestimated in the previous policies (Korsu, 2012). The interdependency between residential and workplace mobility is conditional on commuting cost (van Ommeren et al., 1999) with commuting – via distance and time – having a strong influence in the joint location choice of residence and workplace in theoretical and empirical findings (Merriman and Hellerstein, 1994, Rouwendal, 1998, Clark et al., 2003). Therefore, the model of workplace and residential location can better explain the commuting distance than the residence or workplace alone (Simpson, 1987) and the joint choice better represents the choice behavior among multi-nodal metropolises (Waddell, 1993, Ibeas et al., 2013). Such interdependencies are not only found between residences and workplaces, but also residence and mobility.

2.2 The interdependence between residence and mobility

The impact of residence relocation on mobility

Migration decisions influence commuting decisions. Employed persons who have recently changed residence are more likely to out-commute from their residential sub-region, with transport modes also changing after migration. The destination of inner urban quarters favor public transport and non-motorized transport while suburban neighborhoods favor car use (Scheiner, 2006). According to the IMU - Institut für Medienforschung und Urbanistik (2002), non-motorized transport decreased from 12% to 6%, while public transport decreased from 31% to 15% after residents changed their residential location, moving from the center of Munich to the outskirts.

The impact of mobility on residence relocation

Commuting decisions also influence migration decisions with commuting patterns being an explicative variable in the residence change equation (Romani et al., 2003). Moreover, travel decisions may even precede residential relocation, as households without a car usually do not move to the suburbs and 98% of the households who do migrate to the urban fringe already own one or more cars before the move.

2.3 The directionality between spatial structure and mobility

The previously mentioned theory of 'personal commuting budgets' is rejected by (Levinson and Wu, 2005), as not only are commuting times within the intra-metropolitan area generally unstable over time but they also clearly depend on the metropolitan spatial structure. Poly-centric urban structures tend to be more travel-efficient compared to mono-centric ones. The average distance of commuters in the polycentric cities of Stuttgart (13.5 km) and Frankfurt (16.4 km) is lower than that of the mono-centric cities of Munich (19 km) and Hamburg (20.8 km) (Guth et al., 2011).

The larger the spatial disparity between residential and employment center, the higher the probability that an employed person will use private transport (Cervero, 1989, Messenger and Ewing, 1996). Once the distance between home and workplace is reduced, the probability of using a non-motorized transport mode will increase (Boussauw et al., 2012).

2.4 The role of temporality

Considering the time scale of urban development, supply of new transport infrastructure and land use changes within a region often encourage industrial and residential construction. Moreover, with the influence of economic and demographic development, firms and private households will optimize their location choices in order to gain additional utility (Wegener et al., 1983). In addition to this, economic and demographic development will influence the location choices of firms and private households.

Considering households' decision making processes, residential and workplace location choices are relatively long term choices, while vehicle ownership, transport mode and number of stops during commuting trips are short-term choices. Most analyses focused on the structural impact of the long-term choices on the short term. For instance, residential location is first chosen and then its impact on vehicle ownership and travel mode is assessed. However, the assumption that long term choices condition short-term choices is not always sound. The self-selection effect such as lifestyle preferences and attitudes will simultaneously affect the bundling choice of long and short term decisions (Paleti et al., 2012). Temporality however does not act solely in terms of household residential decision making processes, the spatial component also influences such decision processes.

2.5 The role of space

The multinomial logit model (MNL) is used when the dependent variable is nominal, for example, residential location choices. The model has been largely criticized due to its irrelevant alternative hypothesis especially in the application of location decisions that have a strong spatial element. For instance, some places, especially close ones, could be better alternatives in residential relocations. The sector shape (migration outwards along the center-outer axis) of suburbanization also reflects the attempt to maintain daily relationships after migration (IMU-institute, 2002).

Therefore, Hunt et al. (2004) argued for the need to use models that consider the existence of spatial correlation between alternatives and, namely, more complex substitution patterns. By gradually adding the spatial element into the models, the data fit has been apparently improved.

The discussion above demonstrates the complexity of the systems consisting of job, housing and mobility. Each sub-sector is interrelated and should be considered as a holistic system (this is the objective of the current research) rather than just focusing on a segment of the system (this is found in most of the previous research).

Most of the space-involved models are only applicable to residential locations rather than joint residential and workplace locations. Moreover, few researchers have studied both functional and spatial interrelations within the current complex system. In order to fully understand the interrelations or interactions among the sub-systems household level data, instead of aggregated information, is necessary. The influences of lifestyle preferences should also be included to better understand the true causality in the system.

3. Research framework and hypothesis

The choices of residence, workplace and mobility are interdependent for each individual or household. The directionality of impact is not only from long term choices towards short term choices but also the other way around. On the one hand, households' socio-demographic profiles and housing, job and transport related characteristics affect their demand for the system consisting of residence, workplace and mobility. On the other hand, the housing, job and transport market restrict the supply situation. The final choices of households are the outcome of the dynamic interaction between the demand and supply side (see figure 1).

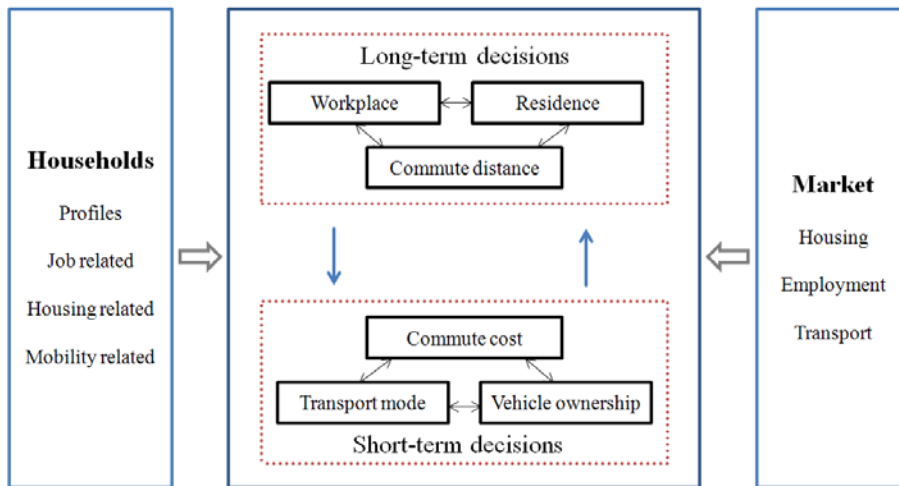


Figure 1: Major actors and interdependencies within the housing-job-mobility triangular system
(Author's illustration)

3.1 Interdependent choices: residence-workplace-mobility

There is strong interdependence (both functional and spatial) between workplace, residence and mobility behavior. Employed persons search simultaneously through both the labor and housing markets, while taking into account both the costs for commuting and moving (van Ommeren et al., 1999). Upon the choice continuum, they face a certain tradeoff between residential, workplace and mobility utility.

In the same way, Thierstein et al. (2013) identified that households tend to trade off centrality or accessibility to public transit access points with longer commuting distance. Prefacing this study, 69% of the suburbanized households in Munich stated that the distance to the next rapid transit station was an important precondition for their residential location choice. (IMU-institute, 2002).

3.2 Macro level influence of housing, job and transport market on the choice continuum

The sequence of changing jobs and residential locations depends on the specific labor and housing market (van Ommeren et al., 2000). Increasing housing prices will shift the population from urban to rural areas and foster the suburbanization process; increasing wages will also shift the population from rural to urban areas, but will however reduce the suburbanization effect (So et al., 2001). Moreover, wages have a larger impact on residential and job locations compared to housing price. Transport related fringe benefits make employed persons less sensitive to the costs of commuting (van Ommeren et al., 2006). Besides, transportation improvement, lowering commuting time or cost will increase non-metropolitan populations and thus encourage non-metropolitan commuters to metropolitan markets (So et al., 2001), which will also lead to a larger commuting distance (Zhao et al., 2011). These interdependent choices, which operate at the macroscopic scale, also find scope within the microscopic scale.

3.3 Micro level influence of household properties on the choice continuum

Individual employed persons choose their locations differently based upon the choice continuum. The bundling choices regarding residence, workplace and mobility all depend on the variables related to employee profiles, employment, housing and mobility properties. Below are the specific hypotheses:

Housing owners tend to have longer commuting distances compared to those who rent; households with children tend to trade off longer commuting distances with larger living spaces and more open spaces in the neighborhood. Individual employed persons still prefer to live in proximity to their workplace and public transit Thierstein et al (2013).

Low-income households who rent usually have a better housing-job balance. A high salary generally encourages both job and residential mobility; while skilled, ambitious individuals already in advantageous positions are more likely to switch employers and search their workplace in a broader spatial extent (Simpson, 1987). Commuting distance in general increases with income and occupational status (Li, 2010). However, a salary threshold seems to be at work whereby above this threshold, commuting will be saved due to its high opportunity cost.

Full-time employed persons have longer commuting distances due to the tradeoff of commuting distance with higher wages; self-employed individuals tend to find jobs in high density areas and are more likely to drive alone; employees with flexible work schedules are more likely to use alternative modes of transport compared to self-employed individuals.

4. Methodology

The research study will apply the following methodological approaches: (1) a conceptual causal model that explains the inter-dependencies between housing, jobs, use/costs of transportation on different spatial scales, by applying Frederic Vester's Sensitivity Model (see chapter 4.1); (2) a GIS based 30 year longitudinal spatial analysis of development patterns of housing, employment and accessibility (see chapter 4.2); (3) a web-based survey of households in the metropolitan region of Munich that have switched location of residence, job and transportation modes within the last three years (see chapter 4.3).

4.1. System model of the interrelations between housing, employment and mobility

A system analysis will be conducted with the help of the "sensitivity model of Frederic Vester. This method allows for the representation of the complex interrelations in dynamic systems. In this case the complete system of the interdependencies between housing, employment and mobility was investigated. The approach of the model allowed the interdisciplinary collaboration of the Chair of Urban Development and the Chair of Urban Structure and Transport Planning as well as external regional stakeholders for setting the model basis and creating a common understanding of the task.

Another essential advantage of the sensitivity model is the possibility to combine quantitative and qualitative indicators by means of a fuzzy logic approach. Ultimately, the focus of the expected model results is not on the description of specific situations at a given point of time but on behavioural systems analysis over time.

4.2. Spatial analysis of development patterns of housing, employment and accessibility

The second phase of the project is a GIS based 30 year longitudinal spatial analysis of development patterns of housing, employment and transport accessibility in the metropolitan region of Munich. Therefore, statistical data are put in a spatial context to visualize the changes over time. Thus patterns of spatial changes and interdependencies of statistical key figures, such as population, age structure, land use, economic strength or labour market, can be found and compared to transport infrastructure. Statistical data are analysed on the level of municipalities.

Apart from the absolute change of statistical key figures over time, the analysis of the local deviation of single municipalities from the average development in the entire research area is a major approach to evaluating local development processes in the region. This way, single regions can be estimated above or below

average change and patterns, whereby underlying mechanisms of spatial development can be found.

We chose a time period of 30 years since it is large enough to avoid the influence of business cycles, mid-term economic cycles or random fluctuations. At the same time, statistical data are available in regular survey intervals in the chosen time period, whereby survey methods did not change much, which ensures a good data comparability. Therefore, the research of recent developments can be reflected to the changes over the last decades. Based on the analysis of past developments and the detailed study of the recent situation, possible trend scenarios can be derived. These scenarios can help to develop strategic means for an improved coordination within the metropolitan region of Munich.

4.3. Web-based household survey

The key empirical approach is a web-based survey where we ask people about location choices that they have made within the last three years. A web-based questionnaire will be linked with a GIS-based map that allows the respondents to pinpoint exactly where they lived or worked before they relocated, where they reside or work today and where they have unsuccessfully searched for job and/or housing alternatives. A particular section of the questionnaire asks the respondents whether these location choices affected their preference in transportation modes. Each individual choice is linked with an assessment of how much the respondent paid before, pays now and was willing to pay before the final choice was made. These revealed preferences are combined with the numbers of income brackets as well as other structural data. Overall, geo-referencing every individual search pattern will produce spatial vectors that allow, when properly visualized, to detect patterns of changing spatial preferences within the Munich Metropolitan Region. First experiences have been successful insofar as authors of this paper produced findings that show clear-cut trade-offs between accessibility of housing, commuting time to workplace, cost and urban amenities (Thierstein et al. 2013).

5. A case study: the metropolitan region of Munich

5.1. Characteristics of polycentric urban structure

The metropolitan region of Munich is located in the south-east of Germany within the state of Bavaria. The core of the region is the city of Munich. Other cities within the region are Rosenheim, Ingolstadt and Augsburg. Wide parts of the remaining area are mainly rural. The area of the metropolitan region measures about 26,000 square kilometers which is 38% of Bavarian territory. With almost 6 million citizens, nearly half of the population of Bavaria is living in the metropolitan region of Munich. Almost half of the Bavarian workplaces are located within this area as well, and more than half of the Bavarian gross domestic product is generated there, thus indicating an above average labour productivity of this polycentric urban area (EMM e.V. 2012).

While the population and workplace development in many areas in Germany is declining, it is increasing in the metropolitan area of Munich. Especially for the greater area around the city of Munich there is one of the highest predicted increases of workplaces and population in Germany. The population growth is mainly due to migration from other parts of Germany and other European countries, but also positive birth rates (LHM 2012a). People moving into the region are confronted with an already very tight housing market, where housing is highly competitive and expensive. The prices for properties, houses, and apartments have been rising for several years. Real estate in the region of Munich is considered to be a particularly safe investment, which stresses the housing market additionally (LHM 2012b).

The economy in the region is characterized by knowledge and research intensive industries, which are considered to be some of the most stable branches in the future. Some of Germany's most renowned companies, universities, and research facilities are located within the area (Thierstein et al. 2007). In the south of the Metropolitan Region tourism traditionally shaped land use through dispersed settlement structure, as of current, tourism still contributes to the overall economy albeit on a diminishing scale.

The availability of skilled workers will be one of the main challenges and is essential when it comes to the future development of the region. The growth of workplaces develops in a very spatially differentiated nature within the Metropolitan Region of Munich.

The public transport network is radially aligned towards the city of Munich. Within the city there is a comparatively dense network of public transport, which is in some parts close to its capacity limits. This compares with a constantly growing demand for mobility.

The developments described above require an improved coordination of supply planning procedures and spatial development perspectives.

5.2. Commuting patterns

The current housing shortage in Munich is resulting in a migration to the more affordable outskirts and rural areas. Due to a rather mono-centric growth of jobs within the City of Munich an increase in commuting distances is observed and will drastically continue (Lohr 2013). This lack of proper regional planning, in terms of labour as well as housing is resulting in growing distances for both commuting and completing activities, as well as the fulfilling of basic needs. Therefore, the TUM Chair of Urban Structure and Transport Planning has developed the GIS-based planning instrument “Accessibility Atlas”. In using this accessibility instrument, land-use transport data can be stored, calculated and visualized.

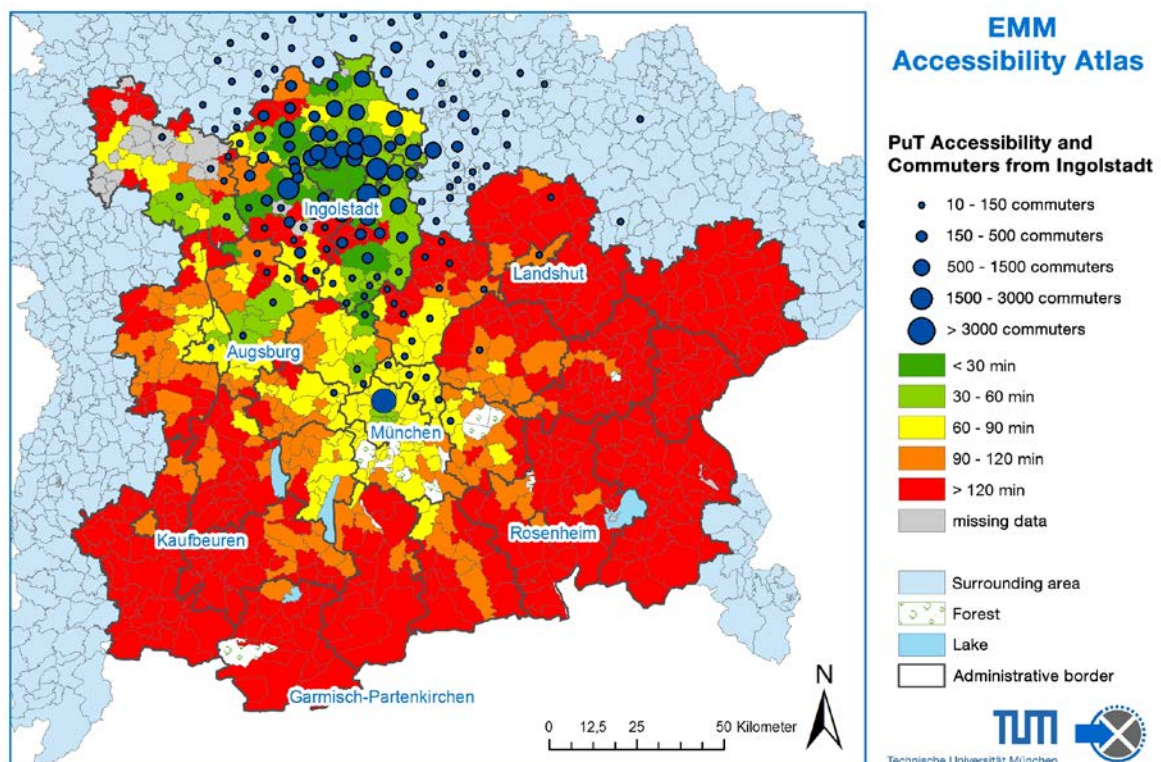


Figure 2: Combination of the accessibility by public transport and commuting flows from Ingolstadt

Figure 2 displays the combination of commuting flows out of Ingolstadt and at the same time the isochrones regarding the accessibility by public transport from Ingolstadt. The majority of Ingolstadt’s commuters (31,770 people) are working in the nearby municipalities (highlighted by the blue dots). Despite the long distance, a high number of Ingolstadt’s inhabitants are working in Munich thanks to the large labor market and the attractive accessibility by rail (Büttner et al. 2011).

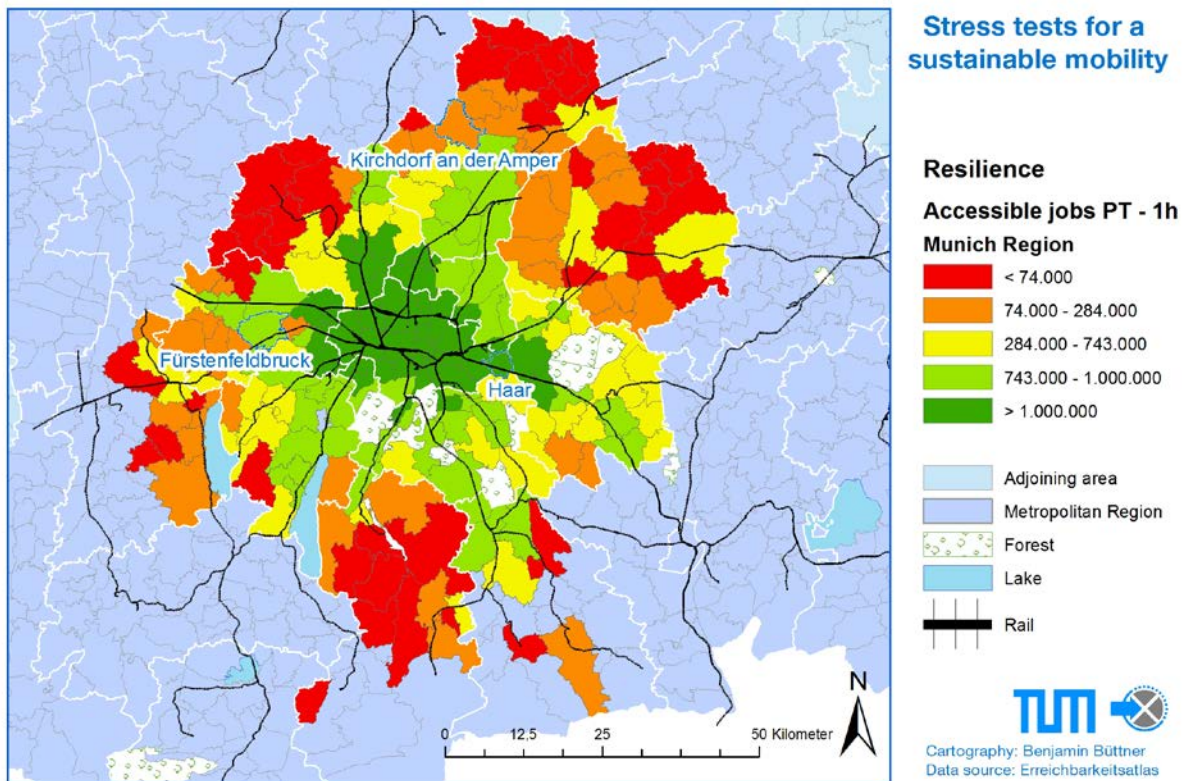


Figure 3: Accessibility to the number of jobs by public transport within one hour in Munich Region

From the dark green municipalities more than 1,000,000 jobs are accessible by public transport within sixty minutes. Additionally, the lack of a proper public transport supply in the red municipalities also causes distance separation from the job market. The inhabitants in structurally weak municipalities have limited alternatives to shift to non-fuel powered modes of transport. Hence, throughout these non-resilient regions commuting and mobility behavior is very car dependent (Büttner et al.).

In this research study, the Accessibility Atlas will be used to store the web-based survey gained data, to calculate and to visualize the status quo. Through the produced maps, the spatial development and patterns concerning residence, workplace location and mobility behavior will be analyzed and communicated to regional stakeholders and decision makers.

5.3. Housing patterns, residential choice

Housing demand in the region of Munich has already been the subject of a study at the Chair of Urban Development at TUM. Such demand has continuously been exceeding supply for years, which as previously mentioned, results in those seeking housing paying much more for housing or not satisfying their requests. The underlying assumption of the study states that successful seekers have to lower their expectations in various fields, for example costs and accessibility, in order to

find a place of residence (Thierstein et al. 2013). The current project will build on the results of the study.

The study analyses the search history of successful house-seekers in the housing market and focuses on the spatial and temporal progress as well as the individual considerations and offers a spatial-dynamic view on the interaction of supply and demand. The impact of architecture, functional environment, location factors, and urban design on the decision concerning residential location and the level of satisfaction after the decision are addressed.

Some of the main findings of the study are that most people search in more central locations than they are actually able to succeed in, in most cases, requirements concerning accessibility and public transport cannot be met. The more central residential locations are, the better they are evaluated by their inhabitants. Crowding-out effects are visible in inner city areas (Thierstein et al. 2013).

Alternate search locations are not necessarily chosen because of their geographical proximity. The similarity of the quality of the location is far more important. Due to the radial orientation of the transport system, polycentric search corridors arise around the city (Thierstein et al. 2013).

Furthermore, the study identifies different priorities when it comes to the decision criteria of different household types and income groups. Low-income groups are especially in favor of central locations with access to public transport and local supply, while for example families tend to place particular emphasis on the residence itself (Thierstein et al. 2013).

6. Expected results and outlook

The integrated approach described above is indeed ambitious. We build upon a thorough analysis of the relevant literature so far and propose to develop an impact or sensitivity model that integrates the decision making processes of individuals who simultaneously change their location of residence, their workplace and the interconnecting transport infrastructure.

The application of such a conceptual model will be a specific spatial configuration (i.e. the Munich Metropolitan Region), which has a morphologically mono-centric structure but which displays a differentiated functional poly-centricity. Geo-referencing each and every individual revealed preference for a bundle of locational qualities and attributes allows for the identification or detection of new and changing patterns of spatial organisation.

The web-based survey will be accompanied by a series of interviews, focus group workshops and expert hearings all allowing us to better understand and interpret the quantitative-spatial findings. This in turn allows for modifying the initial impact model in order to refine and develop the conceptual model further into an explicative one.

A variety of different stakeholders will be able to benefit from the research outcomes. Public authorities, especially on a local level, will understand how large-scale development dynamics affect their counties and communities. Based on this knowledge, they can enhance their profile and identify partners for spatial development opportunities. Providers of transportation infrastructure will be able to look for public or private partners, who benefit from improved accessibility and may contribute to the infrastructural work. On the other hand, private companies will be aware of the needs and preferences of the local labour force and can thereby optimise their integration into the locality. Moreover, housing companies will provide suitable homes more effectively at certain locations.

Together, all outcomes shall help to initiate a more strategic debate among public authorities, providers of infrastructure, housing corporations, as well as other commercial stakeholders and their financiers concerning a sustainable polycentric development of the Munich Metropolitan Region. The research can therefore provide so far rare scientific knowledge about the interdependencies of housing, employment and mobility.

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