**Thesis and Internship**

**Thesis**

The department of Spatial Economics offers many possibilities for writing a thesis. We have an extensive list of interesting and challenging topic suggestions. You can choose a topic from the list, a topic based on something you see on the list, or formulate a topic yourself. Click here for a list of recent theses. You can go to the list of topic suggestions by clicking (hold ctrl-button) on the links below:

- Energy
- Environment
- Housing and real estate
- Networks
- Spatial and Regional Economics
- Transport
- Infrastructure

**Internship**

You may want to combine your thesis with an internship. This allows you to obtain some real-life work experience and assures you of having a very relevant research question. In some cases, internships pave the way to your first job. For bachelor students in economics and business administration, an internship counts for 12 ects. The Department of Spatial Economics regularly gets requests from businesses or (local) governments for students interested in an internship. Arranging the internship is your own responsibility, but we can provide assistance. Below you will find a list of recent and possible internships.

*Example of recent Internships:*

Locatus // Amsterdam Airport Schiphol // NS (Dutch Railways) // Municipality of Amsterdam // Ernst & Young Advisory

*The following companies/institutions/departments had possibilities for internships in the past:*

Port of Amsterdam // Significance B.V. // Economisch Instituut Bouwnijverheid // Railforum (helps students find an internship) // Ministry of transport (students can come with their own proposal) // CPB, Netherlands Bureau for Economic Policy Analysis (Centraal Planbureau) // Netherlands Institute for
Transport Policy Analysis (Kennisinstituut Mobiliteitsbeleid) // Ministry of Economic Affairs (offers possibilities for internships on e.g. spatial economic instruments, freight transport) // Ministry of Education, culture and science (topic on ‘knowledge economy’)

Contact

If you are interested in writing a thesis, or doing an internship, please contact the appropriate coordinator from the list below. You can determine your own topic, which needs approval from your supervisor, or can select a subject from the list of suggested topics. If you have chosen a topic, you can directly contact the thesis supervisor listed at the subject (cc to thesis coordinators).

Thesis coordinators:

TSCM Master: Thomas de Graaf (t.de.graaff@vu.nl)

TSCM Bachelor: Eric Pels (a.j.h.pels@vu.nl)

STREEM: Mark Lijesen (m.g.lijesen@vu.nl)

Bachelor Economics: Mark Lijesen (m.g.lijesen@vu.nl)

Master Earth Sciences and Economics: Mark Lijesen (m.g.lijesen@vu.nl)

Bachelor Aarde & Economie: Peter Mulder (peter.mulder@vu.nl)

Internship coordinator:

Eric Pels (a.j.h.pels@vu.nl) and/or thesis supervisor.
Examples of recent theses are:

De Jong, Wesley (2012), *Network Configuration: Long-Haul flights* (TSCM)

Van Putten, M. (2012), *Identifying the environmental impacts of renewable electricity generation by members of the public by employing a choice experiment to elicit preferences* (Msc Earth Sciences and Econmics)


Spamer, J. (2010), *Determining the future demand of electric vehicles in the Netherlands* (STREEM)

Willem Verhagen (2010), *Effecten van (extreem) weer op verstoringen in het treinverkeer in Nederland* (bachelor Aarde & Economie)

Kasper van der Meulen (2010), *De invloed van de Afsluitdijk op de economische positie van de Nederlandse Hanzesteden*, (bachelor Aarde & Economie)

Winkel, Bas (2009), *Airline pricing and indirect flights*. (TSCM)

Terpstra, Ilse (2009), *Airport choice and the high speed train*. (STREEM)

Annemiek Admiraal & Katrien Dusseldorp (2009), Socio-economic vulnerability to extreme flooding in Vietnam. A case study of Quang Nam province (bachelor Aarde & Economie)

Brenden Jongman (2009), An Integrated Approach to Unification - German sector performance and land use after the fall of the Berlin Wall (bachelor Aarde & Economie)

Schröder, Andreas (2008), *INCORPORATING AVIATION INTO THE EU EMISSIONS TRADING SYSTEM - AN ASSESSMENT OF THE ECONOMIC IMPACT ON CARGO AIRLINES* (STREEM, winner of ‘TIACA Graduate Research Paper Award’).
List of suggested topics

Energy

*The economics of wind power*

Some critics argue that subsidizing wind turbines is an inefficient, expensive, or even countereffective way to combat climate change. Proponents of wind power argue for the exact opposite. Who is right, and on which factors does this depend? What is the future for wind power?

Harry van der Weijde h.vander.weijde@vu.nl

Electricity markets

How can renewable resources (with variable, and to some extent unpredictable output) be integrated in the electricity system?, How do we determine where new transmission lines should be built? How do you price electricity transmission? How do we make sure that that enough power plants of the right types are constructed? How will carbon pricing influence this? (There may be an opportunity for a STREEM student who is not afraid of a certain amount of mathematics and ideally has some experience with a programming language to combine this with an internship at the Energy Research Center of the Netherlands (ECN))

Harry van der Weijde h.vander.weijde@vu.nl

Energy productivity and sustainable development

Enhancing energy productivity is essential for improving environmental sustainability. This project employs frontier analysis as a tool for performing sectoral benchmark studies that can be useful in identifying the sectors where substantial scope for improving energy productivity is present.

Henri de Groot, h.l.f.de.groot@vu.nl

Energy from biomass

Nowadays many people advocate the use of biomass as a substitute for energy from nonrenewable natural resources. Others are strongly opposed because of the fact that large scale use of biomass goes at the cost of food production, in particular in developing countries.

Cees Withagen c.a.a.m.withagen@vu.nl
Environment

Environmental risks: flooding

The Dutch are famous for, and proud of, the century-long successful water and flood risk management. However, can we ever claim we are 100% safe? And should we take it for granted? The Department has conducted a large-scale survey of Dutch residents covering the issues of flood risk and flood safety. Students are welcome to use the data to the best of their creativity. For example, questions that need exploration are: the effects of risk information and risk perception on risk valuation.

Piet Rietveld, p.rietveld@vu.nl, Marija Bockarjova m.bockarjova@vu.nl

The Welfare Impacts of Flood Risks

Flood risks pose a common threat to many low-lying and heavily populated urban areas around the world. It is expected that climate change and ongoing socio-economic developments in flood-prone areas will affect flood risk, for example in the Netherlands. In the last decade a lot of research has been conducted on assessing direct damage to support decision making about flood measures. Indirect damage can, however, account for a significant part of the total damage. Conduct a literature review of approaches to assess the socio-economic vulnerability to catastrophic flood risks, including indirect economic impacts of flood risks.

Marjan Hofkes, m.w.hofkes@vu.nl

Green Growth

For the last 250 years growth has largely come at the expense of the environment. Current growth patterns are unsustainable as environmental damages will at some point in time go beyond the carrying capacity of the earth. The concept of green growth is therefore high on the political agenda. What exactly is green growth? Which policies can achieve green growth? Is there an inescapable trade-off between environmental sustainability and economic progress? Or is a green economy a luxury that only wealthy economies can afford?

Marjan Hofkes, m.w.hofkes@vu.nl
Measuring Economic Performance

Gross Domestic Product (GDP) is the most widely used measure of economic activity. As statisticians and economists know very well, GDP mainly measures market production – expressed in money units – and as such it is useful. It is, however, also well-known that it is a misleading measure of economic well-being. Identify alternative measures/indicators for well-being and assess the advantages and disadvantages.

Marjan Hofkes, m.w.hofkes@vu.nl

Urban spatial dynamics and ecosystem services

Ecosystem services are the set of ecosystem functions that are useful to humans. Not all those services have the same importance in urban areas. By means of a literature review, the first aim of this project is to define the most relevant set of ecosystem services for urbanites. In urban areas, ecosystem services are assumed to be strongly influenced by complex land use patterns, which change over relatively short periods of time. The second aim of this study is to analyze the dynamics of ecosystem services provision over time, following changes in the spatial configuration of urban areas, using a a case study.

Dani Broitman d.broitman@vu.nl

Municipal waste management systems in the Netherlands

Municipal waste management systems and its associated effects, influences and externalities have been addressed as one of the key targets in environmental policies all over the world. Different systems are characterized by their costs, such as waste collection, final treatment and on-going maintenance, their benefits, as revenues from recycled materials, and the policy instruments they apply, as landfill taxes and differential charging. The aim of this project is to review the existing municipal waste management systems in Dutch cities and compare their performance in terms of economic costs/benefits and environmental efficiency.

Dani Broitman d.broitman@vu.nl

Choice of clean passenger cars (e.g. hydrogen, electric)

The question is whether or not consumers buy the cleaner vehicles that are (or will be) for sale. Which factors play a role? Can these be quantified? Can we make forecasts of the demand for these vehicles in 2020?

Eric Kroes, e.p.kroes@vu.nl
Innovation policy with regard to the environment

Innovation is a key issue in environmental policy. It is widely agreed upon that innovation is crucial. How can innovation, and diffusion, best be triggered, meaning what kind of environmental policy is most effective in doing so?

Cees Withagen, c.a.a.m.withagen@vu.nl

Choice of clean passenger cars (e.g. electric, hybrid)

The question is whether or not consumers buy the cleaner vehicles that are (or will be) for sale. Which factors play a role? Can these be quantified? Can we make forecasts of the demand for these vehicles in 2010 and 2020?

Eric Kroes, e.p.kroes@vu.nl

Climate change

One of the issues in the economics of climate change is whether it is better to try to reduce CO₂ emissions in order to reduce the probability of climate change occurring, or to put more effort in adapting to climate change once it occurs. List of the pros and cons.

Cees Withagen, c.a.a.m.withagen@vu.nl

Discounting

In long run studies on the effects of climate change an assumption needs to be made with regard to the rate at which future benefits and costs should be discounted. In fact, for the optimal policy to be pursued it makes a big difference whether this rate is large or small. Survey the literature on this issue.

Cees Withagen, c.a.a.m.withagen@vu.nl
International environmental agreements

Generally it is difficult to involve many countries in international environmental agreements, except possibly if the agreement does not go further than what countries would already do by themselves. Why is this? Are there mechanisms that would get more countries on board, for example by extending the agreement to cover more issues?

Cees Withagen, c.a.a.m.withagen@vu.nl

Housing and real estate

The determinants of vacant offices

The vacancy rate in the commercial property market, especially in the market for offices, is an important subject of political debate in the Netherlands and receives considerable attention in the media. Because of the economic downturn, the Dutch national vacancy rate has increased from 4 percent in 2000 to about 16 percent in 2010. It is observed that vacancies tend to be strongly geographically concentrated: some business parks experience vacancy rates up to 90 percent. However, little is known about the geographic and locational determinants of vacancy rates. Can the geographical concentration of empty offices be explained by obsolete building characteristics? Or, is this concentration explained by certain location attributes, such as a poor accessibility? Another interesting question is whether there is an external effect of vacant offices. Using a unique micro-panel dataset on empty office buildings, one may answer these questions.

Hans Koster, h.koster@vu.nl

The price of beauty

In contemporary cities substantial amounts of money are invested in architecture to improve the quality of the built environment and increase the attractiveness of the inner city. Recent examples of such fancy projects are The Rotterdam, a large multifunctional building at the Kop van Zuid in Rotterdam designed by Rem Koolhaas and New Babylon in the Hague, designed by Roberto Meyer. It is an open question whether the market prefers buildings designed by trophy architects and puts a price on ‘beauty’. Using unique datasets on commercial properties or residential properties, one may determine the price of iconic designs using a hedonic price approach.

Hans Koster, h.koster@vu.nl
Rent control

Rent control causes excess demand, but the difference between market rents and controlled rent depends on the location of the house. This suggests that cheap rental housing will be attractive to a much larger group of households in areas where owner-occupied housing is expensive than where it is cheap. In particular one expects that more households with medium incomes will choose to remain in rental housing in the big cities of the Randstad. Is this true?

Jan Rouwendal, j.rouwendal@vu.nl

Real estate research

The Department has access to one of the largest real estate databases in the world. Students with innovative ideas can work with the database. Interesting ideas we suggest are: the effect of regulation and policy, new infrastructure (e.g. highways) on property prices. Another idea is to examine the effect of nearby property vacancies on property prices, which is frequently discussed in the media but never examined.

E-mail: j.n.van.ommeren@vu.nl.

Mortgage interest deductibility and the Dutch housing market

The Dutch housing market is unique in Europe for the unlimited deductibility of mortgage interest paid by homeowners. Although this tax benefit exists for a long time, a tax reform in 2000 made it even more attractive to have a large mortgage than was the case in earlier years. An additional tax measure in 2004 attempted to mitigate this incentive. What were the effects of these changes?

Jan Rouwendal, j.rouwendal@vu.nl

Ageing and home ownership

It is well known that elderly people are more reluctant to move than younger people, although they often live in relatively large houses and deteriorating health makes it difficult to climb stairs and maintain of a garden. Recently collected stated preference data enable one to investigate a possible discrepancy between the desired and actual housing situation.

Jan Rouwendal, j.rouwendal@vu.nl
Diverging house prices

A lot of casual evidence suggests that the prices of luxury housing increase more during a boom and decrease more during a bust. Is this really true for local Dutch housing markets?

Jan Rouwendal, j.rouwendal@vu.nl

Cross border price gap

The prices of houses are determent by house characteristics and the neighboring amenities. Controlling for house characteristics and neighboring amenities helps to explain why certain amenities have a certain effect. Comparing houses on both sides of the border helps to explain what effect policy has on house price dynamics. In this thesis you are comparing house prices on the German-Dutch border and are trying to investigate the effect of policy on house prices.

Jan Rouwendal, j.rouwendal@vu.nl Faroek Lazrak, f.lazrak@vu.nl

Restricted land ownership and house prices

In Amsterdam many homeowners do not own the land on which their house is built. They have to pay a kind of rent to the municipality. One expects that this has an impact on the value of these houses. Is that really the case?

Jan Rouwendal, j.rouwendal@vu.nl

Land prices for houses and firms

There are large differences in land prices on sites used of residential and firm development in the Netherlands. What are the reasons behind these differences?

Jan Rouwendal, j.rouwendal@vu.nl

House price developments at the neighborhood level

Casual evidence suggests that house prices can decrease in one area, while they increase at surrounding neighborhoods, and vice versa. Does this happen in Amsterdam and can the price movements be explained?

Jan Rouwendal, j.rouwendal@vu.nl
Networks

Alliance formation of transport services suppliers

In aviation and sea transport we observe a trend towards stronger roles of alliances of suppliers. This calls for an analysis of welfare effects of alliances.

Piet Rietveld, p.rietveld@vu.nl

Competition between maritime networks/ports.

Local governments may be interested in a prominent position in a maritime network because of the associated economic effects: employment, tax revenues etc. But in the end shipping companies decide if they visit the port (regularly). What makes a port an interesting destination in a maritime network, and how can a local authority use this information to gain or maintain a prominent position in a maritime network? The competitive position of a port of course also depends on the efficiency of hinterland connections. This may be the focus of this research.

Eric Pels a.j.h.pels@vu.nl

Optimal distance to public transport stops: trade-off between walking distance, speed, frequency and cost

In designing local public transport networks an important choice is the distance to the stops. For example, at present Amsterdam requires a tram or bus stop within 400 meters of each house in a large part of the city. The walking distance to stops is partly determined by the distance between stops on a line, but mainly by the network density. Having less stops on a line increases travel speed. A less dense network makes higher frequencies possible for the same cost. The student is asked to make a theoretical analysis of those trade-offs in a simplified city model, and to compare stop distances in various regions or cities empirically.

Jaap de Vries, j.j.de.vries@vu.nl

Spatial and Regional Economics

Vital shrinking regions?

A shrinking population becomes problematic as soon as the economic vitality, or the quality of life, is negatively affected. However, vitality or quality of life, are concepts that are difficult to define precisely.
They are multidimensional by nature and largely depend on the perception of individuals. This makes it difficult to develop successful and efficient policies.

Therefore, it is important to clearly define the different dimensions of the qualitative aspects of population shrinkage, as well as to evaluate the perception of different stakeholders. Vitality might mean something different for firms, policy makers, students, elderly etc.

This research takes into account the different dimensions of population shrinkage and vitality together with the perception of different stakeholders by adopting a multi-criteria approach. This includes collecting interviews or questionnaires.

Eveline van Leeuwen e.s.van.leeuwen@vu.nl

Determining the right spatial level to study population shrinkage.

Shrinking populations and the related problems with vitality and quality of life is an important new research theme. An important aspect within this research is the spatial level of analysis. When looking at the regional level, the COROP of the South of Limburg has a severe shrinking population. However, when zooming in on the municipal level, clear differences appear, which even remain when looking at the neighborhood level. Therefore, an important issue is to find the suitable spatial levels for different aspects of population shrinkage.

In this research, you will build on earlier work. This means that most of the data is already there. An important aspect of the new research will be to develop a way to assess the suitability of different spatial levels for shrinkage related studies.

Eric Koomen e.koomen@vu.nl and Eveline van Leeuwen e.s.van.leeuwen@vu.nl

Only 100,000+ Municipalities?

The new government is making plans to reorganize the Dutch municipalities in such a way that they all exceed 100.000 persons. Important reasons that are mentioned are the advantages of scale enlargement and increasing efficiency. An important drawback is the large number of municipalities that (again) have to go into the tough reorganization process. In the literature, the issue of the optimal size is
for example described by Drazen who focuses on the optimal size of countries, or by O'Sullivan who focuses on fiscal federalism issues.

For the Dutch government, it would be very useful to better understand advantages and disadvantages of larger municipalities, as well as to recognize success and failure factors of the reorganization process itself. In addition, a reorganization proposal could be sketched based on the findings.

Henri de Groot h.l.f.de.groot@vu.nl and Eveline van Leeuwen e.s.van.leeuwen@vu.nl

Migration in Europe

Labour mobility in Europe is far more limited than in for example the USA. This project aims to identify the factors that affect migration flows between regions and countries. Specific attention may be devoted to, for example, transferability of pension rights and cultural barriers.

Henri de Groot, h.l.f.de.groot@vu.nl

The effectiveness of innovation policies

Many countries attempt to stimulate innovation with subsidies and other policies, expecting positive effects on economic growth. If such policies have positive effects, these effects may occur in particular in regional clusters which specialize in specific activities, such as Silicon Valley in the United states or the Eindhoven region in the Netherlands.

The aim of this project is to review the literature on the quantitative effects of innovation policies, compiling a database of research results, and performing exploratory analysis on these data. The thesis will be combined with an internship at the Ministry of Economic Affairs.

Carl Koopmans, c.c.koopmans@vu.nl

Globalisation and regional development

Globalisation has potentially serious consequences for a small open economy such as the Netherlands. What are the impacts of globalisation on the economic development of the regions around the Rotterdam harbour and Schiphol? Is the function of the Netherlands as a Gateway to Europe attractive from a social welfare point of view.

Henri de Groot, h.l.f.de.groot@vu.nl
Globalisation and regional income inequality

Globalisation has potentially drastic effects on labour markets. It may result in sectoral restructuring and widening of income inequalities between the low- and high-skilled. This project aims to identify the impact of globalisation on urban labour markets.

Henri de Groot, h.l.f.de.groot@vu.nl

Geography and economic growth

Poor countries are concentrated around the equator. Is that a coincidence, or does geography (climate) play a role? If the latter is true, what exactly is that role? What about the role of geography in explaining regional differences in economic performance within Europe or within the Netherlands?

Peter Mulder, peter.mulder@vu.nl, or Henri de Groot, h.l.f.de.groot@vu.nl

Trade and institutions

The intensity of bilateral international trade depends on distance, where distance has multiple dimensions. This project aims to identify the empirical relevance of institutional barriers to trade such as waiting times in harbours, bureaucracies, corruption, etc.

Henri de Groot, h.l.f.de.groot@vu.nl

The effectiveness of European Cohesion Policy

European Cohesion Policy is by far the most intensively used policy instrument to foster convergence among regions and member states in the EU. The effectiveness is oftentimes disputed. This project aims to empirically investigate the effectiveness of Cohesion Policy and to identify the factors that may enhance its effectiveness.

Henri de Groot, h.l.f.de.groot@vu.nl

Who is the most efficient landscape manager?

There is a lot of discussion about the usefulness and efficiency of agricultural subsidies. Farmers receive money for agricultural production but also for landscape or even nature conservation. Next to farmers, the government also provides funds to other actors to preserve landscapes and nature. A interesting
question is what the most efficient approach is: to pay farmers or other organizations for landscape management.

Eveline van Leeuwen, e.s.van.leeuwen@vu.nl

Ethnic concentration

The active mixing of population groups is sometimes proposed as an important instrument for keeping cities attractive and livable. Is there an economic argument for such policies? If so, would it be better to do it by rationing, through subsidies and taxes, or yet in another way? This topic requires substantial analytical skills.

Thomas de Graaff, t.de.graaff@vu.nl

Accessibility and agglomeration externalities.

Secondary cities, that have good accessibility to primary cities loose relatively often a substantial part of their level of amenities – one can think of Purmerend, Almere and Amstelveen. Namely, it becomes easier for individuals of the secondary city to use the amenities of the primary city, which, under influence of agglomeration externalities, grow incessantly. The project envisages a literature review and empirical analyses using e.g. travel data.

Thomas de Graaff, t.de.graaff@vu.nl

The size and structure of (Dutch) regional labor markets

In most countries the size of regional labor markets is easy to determine by looking at the primary city, its secondary cities, its tertiary cities and so on. Indeed, commuting data for countries as the US and New Zealand confirm that more than 95% fall in such isolated regional labor markets. In more densely populated countries such as the Netherlands, regional labor markets tend to overlap each other. Moreover, commuting data shows that labor markets are not ‘symmetrical’, but that there seems to be a clear geographical pattern. For example, in the Netherlands – on average – persons live east to their workplace, creating a pattern of partly overlapping labor markets running from west to east. The project envisages a literature review and empirical analyses using e.g. travel data.

Thomas de Graaff, t.de.graaff@vu.nl
Cities and the digital economy

Although the importance of the digital economy is growing rapidly, we still know little about its reflection on space. For instance, we are still lacking a coherent understanding of the geography of the Internet both from a supply and a demand side. While the latter might represent the Internet users, the former could reflect the digital infrastructure, which is responsible for the Internet function. And most importantly, we know little about the economic and spatial impacts that digital economy – and all its different layers – can generate.

The aim of this project is to analyze the economic and spatial impacts of the digital economy at the urban scale. The city of Amsterdam, which is a well known global Internet hub, can be used as a case study. The project will analyze the local impacts that can be generated because of the concentration of extensive digital infrastructure (e.g. Amsterdam Internet Exchange Point) and the consequent global role that Amsterdam performs in the Internet function.

Emmanouil Tranos, e.tranos@vu.nl

Meta-analysis of Dutch retail flows (koopstromen onderzoeken)

In the Netherlands a lot of research is done on where households do their shopping. This is of interest to retail-chains if they want to open a new store somewhere. But it is also important to municipalities that have to decide where to keep shopping centers and where to close them. Therefore, they often ask research bureau’s or consultancies to map out the retail flows in their specific region. This means that for many municipalities information is available, but not for the Netherlands as a whole. Therefore, it would be interesting to combine all existing outcomes and to analyze them in a meta-analysis framework to search for conclusions that are viable for larger regions or even for the whole of the Netherlands.

Eveline van Leeuwen, e.s.van.leeuwen@vu.nl

Hotelling and the art of motorcycle maintenance

Hotelling’s model of spatial competition may be expressed in a reduced form, where the location of suppliers depends on (relevant) population density and distances. For the Netherlands, relevant data are available on a fairly low aggregation level (PC4) for motorbike repair shops, allowing an empirical application of the model.

Mark Lijesen, m.g.lijesen@vu.nl

Location choice: multiple firms versus multiple outlets
Hotelling’s model of spatial competition is a well known tool for analyzing location choice and has a huge number of extensions in the literature. Among these extensions, one can find a broad literature on spatial competition when firms have more than one outlet. In these studies, multiple outlet oligopoly outcomes (e.g. two firms, each with three outlets) are only compared to monopoly outcomes, not with the outcomes of a competitive market with the same number of stores (e.g. six firms, each with one outlet).

Mark Lijesen, m.g.lijesen@vu.nl

Spatial Analysis

Please note that all topics in spatial analysis below call for a working knowledge of Geographical Information Systems (GIS) and/or basic statistical analysis techniques.

Analyzing the spatial structure of Amsterdam

One of the most popular models in urban economics is that of the monocentric city. In this context, the city is formed by a central business district (CBD), where everyone commutes to work and around which people live. Over the last decades, there has been a process of decentralization of work and life by which both economic activities and residential functions have moved away from the center of the city, either clustering in subcenters or simply spreading out. This process has been very well documented for cities in countries like the US but not so much for other parts of the world. In an applied context, the literature on employment center identification is extensive but far from conclusive.

For this project, we will focus on the city (or metropolitan region) of Amsterdam and consider the following questions (each of which could represent a separate project in itself):

- What results do different proposed methods to identify employment centers yield in the case of Amsterdam? Are they robust? Do we get the same "picture" of the spatial structure of the city?
- Many studies use employment or population density to study the spatial structure of a city. Can we think of new variables that can help bring new insights (firm location, land-use, geo-referenced social network etc.)?
- The employment center literature considers typically aggregates for employment. Do we get different pictures if we look at different types of employment (e.g. retail Vs. banking, or industrial vs entertainment)?

Key to this project is the use of spatially very detailed data and some elements of spatial statistics/analysis techniques. For this reason, some basic knowledge of GIS or spatial data handling is required. If the student is interested, we can use this project as a way to explore and get familiar with more advanced spatial analysis software such as OpenGeoDa, PySAL or R's spdep.
**Rural vitality**

Concern for the socio-economic vitality of rural areas has stimulated various development programmes. This analysis aims to apply a methodology to quantify this policy concept following a strict socio-economic interpretation and use it to assess the performance of rural vitality in the Netherlands. The use of a Geographical Information System (GIS) and highly detailed spatial data are crucial in this approach. The analysis involves the collection and manipulation of new data sets and their analysis using GIS, as well as the interpretation of the results from a spatial policy perspective. Specific interest will be paid to linking socio-economic performance of small settlements with their relative distance to the centre of the country or regional economic centres.

Eric Koomen, e.koomen@vu.nl

**Spatial multi-criteria analysis of Dutch municipalities in the context of declining populations**

There is a lot of fuzz about the declining population that already takes place in regions such as the south of Limburg and the north of Groningen, and that will take place in the near future in many other Dutch regions. It is a subject that is difficult to grasp and policymakers have big problems dealing with it, or even thinking about it.

However, shrinkage in one area might be less problematic compared to the other. Not only the absolute or relative decline is important, but also the structure of the population, the accessibility to larger centres, the availability of facilities and other amenities that make a place attractive. Therefore, this analysis aims to map out the level of impact of population decline by evaluating a wide range of characteristics of municipalities using a multi-criteria framework. The analysis involves the collection and manipulation of new data sets and their analysis using GIS, as well as the interpretation of the results from a spatial policy perspective,

Eveline van Leeuwen, e.s.van.leeuwen@vu.nl

**Perceptions of distance to retail outlets**

Economists tend to assume that people are perfectly informed and rational. In real life, people may however make estimates, which are partly fed by facts and partly based on experience, habits and perceptions. For some variables, such as the distance to retail outlets (or other facilities) can be objectively measured and compared to the estimates people make and perceptions people have. What drives peoples’ perception of distance? Which factors determine whether someone thinks a shop is closer/further than it actually is?
Spatial patterns of market entry

If firms enter a market, they are likely to choose a location based on where the customers are and where their competitors are. In a static analysis, this is fairly straightforward, but the real world is not static. For incumbent firms, relocation may be costly when circumstances change, but new firms are (up to a certain extent) free to choose their location. Where do new firms locate if circumstances change, like in the case of rapid development, or in the case of increasing competition? Are spatial location patterns of incumbents a reflection of similar developments in the past?

Land-use change

The analysis and simulation of land use change offers many options for research. Current options relate to:

- **Analysis of trends and driving forces** in past land use changes. Such research focuses on the explanation of for example observed urbanization patterns and land prices in specific countries or regions through statistical (regression) analysis.

- **Simulation of future land use** is possible with the existing Land Use Scanner model. Research options exist to help develop new applications (e.g. in the context of climate change), help improve the model (e.g. include land use intensity) or validate model applications based on statistical (regression) analysis.

- **Impact assessment** of anticipated land use changes. The ultimate goal of most simulation studies of future land use is to inform policymakers on the possible future state of several policy related issues. Helping develop new indicators that describe (environmental) impacts of land use change, related to for example the deterioration of landscapes, is a priority for further research.

Value of Location

The Department has access to one of the largest real estate databases in the world. This database contains all residential real estate transactions that involved a broker from the Dutch Association of Real Estate Brokers (NVM). A lot of information about the objects bought and sold is recorded, including their location. In this research we initially focus on the value of location of houses only. We have used regression analysis to remove the value of object characteristics from the transactions, essentially leaving us with the value of location. An interesting question to research would be what (spatial) factors
explain the value of location, how do they contribute and to what extent? For more information on the topic, the methodology and the data, see www.landvalues.nl.

Jasper Dekkers, j.dekkers@vu.nl

*The spatial impact of information and communication technologies.*

The implementation of new information and communication technologies is expected to influence Future urbanization patterns in the Netherlands (Muhammad, 2007). Using models of land-use change a spatially explicit assessment can be made of this influence. This approach can be used to contribute to ongoing debate on the death of distance. This thesis will start with literature review and will then be followed by the implementation of obtained relations in a land-use model for the Netherlands or, if sufficient data is available, another European country.

Eric Koomen, e.koomen@vu.nl

*Analyzing land-use density*

In recent years highly detailed spatial data on building locations, building heights, sealed surface fractions, numbers of inhabitants and employees has become available to describe densities in land use. Using these data sets it becomes possible to characterize land-use densities according to different definitions and explain density differences from different spatially explicit driving forces. Depending on the student's expertise and interest research can focus on the description of density differences (mainly using GIS) or their explanation (mainly using statistics packages as SPSS).

Eric Koomen, e.koomen@vu.nl

*The future of Dutch Greenhouse horticulture*

In the Netherlands greenhouse agri/horticulture is a major industry. Yet, traditional sectors (vegetables, roses etc.) and concentration areas (e.g. Westland) lose their comparative advantage to other sectors (orchids) and areas (e.g. Aalsmeer). This study aims to review current trends and developments in greenhouse agri/horticulture and will focus specifically on their spatial dimension: which areas are likely to decline, which will grow? Based on this literature review a scenario-based approach can be used to an assess potential future developments, possibly applying a land-use simulation model.

Eric Koomen, e.koomen@vu.nl
Transport

Pilot projects to stimulate the use of electric cars in the Netherlands: results and users’ experiences

Although electric cars are often considered to be sustainable alternatives to fossil-fuelled road transport, their low performance and high costs have so far substantially hampered a large-scale consumer adoption. In an attempt to stimulate the demand for electric vehicles, governmental agencies (such as AgentschapNL) and private organisations have been implementing a series of pilot projects ("proeftuinen"). These projects aim to investigate the main barriers to the broader use of electric cars, analyse the experiences of the first users, and find ways to address current bottlenecks in the evolution of electromobility. Students are challenged to perform a review of relevant literature and policy documents, as well as a number of interviews with the coordinators of pilot projects and the end users of electric cars, in order to analyse the motivations, experiences, attitudes and perceptions of the "proeftuinen" participants.

Good knowledge of Dutch is required

Piet Rietveld, p.rietveld@vu.nl; Marija Bockarjova, m.bockarjova@vu.nl
Alexandros Dimitropoulos, a.dimitropoulos@vu.nl

Meta analysis of valuation of characteristics of international travel

The valuation of travel characteristics (such as travel time, waiting time, frequency and so on) of international travel (air, ferry, train) is highly relevant for policy makers. Empirical research on the valuation of travel characteristics comes in many forms and is often hard to compare however. Meta analysis is a powerful tool that can be used for comparing these outcomes and deriving general conclusions from very diverse research outcomes.

Mark Lijesen, m.g.lijesen@vu.nl

Time of use preferences of air travelers

Traveler preferences for a certain time of arrival or departure and the valuation of deviations from that preferred time have received a lot of attention in road transport and recently also in public transport. For air transport, research this topic is scarce however. At what times of day do air travelers prefer to arrive (or depart)? How bad do they feel about arriving earlier or later? What is the impact of trip purpose on these outcomes? Obviously, for longer East- or Westbound trips, the impact of time zones comes into play as well.

Mark Lijesen, m.g.lijesen@vu.nl
Firm survival rates in civil aviation

Airline (city-pair) markets are volatile. Firms come and go, enter new markets and stop serving old ones. What are the driving factors behind these decisions and what is their relevant importance? What determines whether a firm decides to continue serving a market can be addressed in a so-called survival rate analysis of airline service in city pair markets.

Mark Lijesen, m.g.lijesen@vu.nl

Mode choice for shopping: will paid parking reduce shop revenue?

Shop owners in historical city centers often stress the importance of accessibility by car. But for reasons of space, safety and environment city governents want to reduce car traffic in historic centers. The research question is what is the actual share of the various modes in shop revenue. What will be the effect of higher parking fares: none, mode substitution, of shopping center substitution?

Jaap de Vries, j.j.de.vries@vu.nl

Data driven research on car sharing

Our department has a database on trip details from a car sharing company (Car2go) for Amsterdam. What are the spatial patterns of users in this market? Analyzing the spatial patterns of those trips could lead to interesting conclusions on the relative position of shared cars relative to other modes of transport in an urban setting. A working knowledge of GIS is recommended for this project.

Eva Gutierrez Puigarnau, e.gutierrezpuigarnau@vu.nl

Distributional effects of road congestion pricing

An important reason why road pricing meets resistance is its redistributive effect. When pricing reduces travel times and increases monetary costs, an individual’s losses are smaller—or gains are larger—when the value of time is higher. Although there is no perfect correlation between the value of time and income, this is often taken as implying that the poor lose and the rich gain. But are things as simple as this?

Vincent van den Berg, v.a.c.vanden.berg@vu.nl
**Auto fuel taxes as an alternative to road congestion tolling**

Imposing higher fuel taxes should but much cheaper than congestion tolling: fuel taxes are already levied at low costs, while tolling schemes tend to have substantial operating costs. When users drive more (and thus cause higher congestion externalities), they also use more fuel and thus pay more fuel taxes. Moreover, fuel consumption is also higher in heavily congested areas and times of the day (where/when externalities are high). But the relation with congestion externality caused and fuel tax paid is imperfect: fuel consumption also depends on other factors (e.g. driving style and type of car).

Vincent van den Berg, v.a.c.vanden.berg@vu.nl

**Taxi deregulation**

The experiences with taxi deregulation, nationally and internationally, are mixed. Can we explain from an economic perspective why regulation was in place in the first place, and why the effects of deregulation may not always be as expect?

Erik Verhoef, e.t.verhoef@vu.nl

**Causes and effects of the variation in prices of air tickets**

In many flights almost every passenger pays a different price for his or her ticket. Airlines vary their prices almost continuously, generally for good reasons. For the consumer, however, this may be very confusing: when is the best moment in time to buy your ticket? And for the researcher the question is: what price(s) should I put into my demand model? For this topic you will research the actual air fare pricing structure, the motivations that airlines have for creating this structure, the reactions of the consumers and the consequences for the demand modeller.

Eric Kroes, e.p.kroes@vu.nl

**Perceived travel costs in mode choice**

Travelers base their mode choice on perceived travel costs and travel times, rather than actual values. When differences between perceived and actual costs are systematic and substantial, misperceptions can influence mode choice. Empirical information on this issue may be very relevant for transport policy. Researching this issue is an empirical challenge, involving the use of both stated and revealed preference data.

Mark Lijesen, m.g.lijesen@vu.nl
Congestion pricing in a small country

The possibility of road pricing to eliminate externalities and the welfare increase that result from this are well known. The question is what are the possibilities and effects of road pricing in a small country? Through-freight-traffic by foreign transporters can cause substantial road damage, whereas often these transporters pay few or no taxes in the small country. In a small country it might be difficult to price drivers from other countries. Conversely, if it is possible to separately toll foreigners it might be interesting to ask them a toll that is higher than the externality they cause, thereby creating extra toll revenues.

Vincent van den Berg, v.a.c.vanden.berg@vu.nl

The value of punctuality for public transport

Public transport users tend to prefer a regular service, and trains or buses that depart and arrive on their scheduled times. But often it is difficult for the operator to provide a totally punctual service, and the cost for providing such a service might exceed the benefits. What does the existing literature say about the value of punctuality? How can research be conducted to determine this? And how can the results of such research be applied in practice? There is an SP data set available for trains in the Paris Region that can be used for the empirical analysis.

Eric Kroes, e.p.kroes@vu.nl

The value of crowding in urban public transport

In cost-benefit analyses (CBA) the main benefit of a new (public) transport service is often the gain in travel time for the existing users. Effects like reduction of crowding are typically disregarded. This may be one of the reasons why many new public transport projects have an insufficient benefit/cost ratio. Study the theoretical and practical possibilities of determining the value of crowding, and bringing this element into the CBA framework. We have different sets of SP experiment data for the Paris region available for analysis by interested students.

Eric Kroes, e.p.kroes@vu.nl

Passenger priorities for quality and comfort in urban public transport

The quality of the bus heating system, the noise inside the vehicles, the design of the seats and other factors describing the quality of public transport do influence travellers when making their modal choices. But little is known about what travellers find most important, in other words: if we have a fixed budget available for improving the PT system, where should we spend it on first? Study the literature
about this topic, and the sorts of research methods available for quantifying the priorities for improvement. Also check what the impact on demand might be. We have a large SP data set available based upon a best-worst-scaling experiment carried out in the Paris region for empirical analysis.

Eric Kroes, e.p.kroes@vu.nl

*The value of comfort in high-speed trains*

The high-speed rail system in Europe has been quite successful in competing with air for passengers travelling over distances between 200 and say 700 km. The first class sections of these trains are often fully booked, mainly by business travellers. One of the elements determining this success must be the comfort provided by the high-speed trains. Study what is known in the literature about the so-called value of comfort, for different segments of passengers using air and high-speed rail. And design and/or analyse an SP survey to determine these values.

Eric Kroes, e.p.kroes@vu.nl

*Changing transport flows (expectation of future bulk or container flows).*

Investments in transport infrastructure and location decisions of transport firms and distribution centers critically depend on the expectations of future demand levels. This thesis looks at the determinants of transport flows, and combines scenario analysis and e.g. gravity modeling to explain current and predict future transport flows.

Eric Pels a.j.h.pels@vu.nl

*Economic geography of maritime networks.*

Airline network optimality has been a popular topic in the literature for years. Maritime networks received less attention, although there are studies on the optimality of maritime networks. The goal of this thesis is to describe network optimality from a profit maximizing shipping companies’ view. What ports need to be visited, given the demand levels and cost factors? Do we provide door-to-door service, or do we rely on complementary modes to transport containers to their final destination?

Eric Pels a.j.h.pels@vu.nl
Efficiency of maritime terminals.

Investments in maritime terminals require huge amounts of money. But how successful are such terminals? This research defines efficiency measures to evaluate the “success” of maritime terminals, and then proceeds by using these measures to estimate the efficiency of selected terminals. The efficiency measures are based on a literature review. The terminals for which the efficiency is evaluated are also selected based on the literature review. Data collection plays an important role in this research.

Eric Pels a.j.h.pels@vu.nl

Measuring competition in the rail sector

Competition in the rail sector can take many forms, and as with many regulatory issues, the devil seems to be in the details. This raises the conceptual question how the intensity of competition in the rail sector can or should be measured. Is any of the standard competition indicators sufficient, or should we develop new ones?

Mark Lijesen, m.g.lijesen@vu.nl

Fixed car costs and quality

A simple microeconomic model of car quality choice suggests a relationship between annual fixed cost, the number kilometers driven and willingness to pay for quality aspects. It can be used to estimate this willingness to pay.

Jan Rouwendal, j.rouwendal@vu.nl

Airport strategies

Many airports are or will be privatized. A common concern is that airports have monopoly power, so that some form of regulation is necessary. Recently, some researchers claimed that regulation will do more harm than good. How do privatized airports set prices? When do airports get the proper incentives to set the output/prices at the welfare maximizing level?

Eric Pels, a.j.h.pels@vu.nl
Airport quality

Airports invest a lot of money to improve their quality, so that passengers will select the airport in question as a departure or transfer airport. But do passengers value quality? How does airport quality influence the passenger’s decision for a departure airport?

Eric Pels a.j.h.pels@vu.nl

Airport efficiency

A number of airport efficiency studies are available from the literature. Most of these studies are data driven: Analyze the efficiency of producing ‘passengers’ by using ‘runways’ and ‘terminals’. Information about the actual production process is lacking: what production factors are really used, and how should we analyze airport competition?

Eric Pels, a.j.h.pels@vu.nl

The choice of access mode to the airport: how do we get there?

Passengers prefer airports that are nearby and that offer a large number of flights. But also the presence (or not) of a frequent high quality railway service to the airport is important, and so are many other factors. Study the theory of airport access mode choice, and analyze revealed preference mode choice data that is available for Schiphol airport. Look also at different nesting structures.

Eric Kroes, e.p.kroes@vu.nl

Urban transport systems

Transport systems are often analyzed in isolation. E.g. a price increase in rail is often analyzed without looking at the consequences for other modes. How can we model the interaction between different modes?

Eric Pels a.j.h.pels@vu.nl
**IJmuiden locks**

The Port of Amsterdam wants to expand, and for this it is necessary that the capacity of the IJmuiden locks is increased. Cost-benefit analysis of this project shows that the cost may exceed the benefits. Are there other possibilities for the Port of Amsterdam to expand? What is the competitive position of the Port of Amsterdam?

Eric Pels a.j.h.pels@vu.nl

**Airport/seaport companies**

Companies offering services in both aviation and shipping markets have specific demands. What type of companies are active in these markets? Does the Port of Amsterdam meet the selection criteria for such companies?

Eric Pels a.j.h.pels@vu.nl

**Carbon footprint Port of Amsterdam**

All kinds of activities take place in the Port of Amsterdam. All of these activities somehow cause CO₂-emissions. What is the carbon footprint of the Port of Amsterdam? What models/data are available to determine the CO₂ emissions of the different activities? What policy advise can you give to the Port of Amsterdam based on the analysis?

Eric Pels a.j.h.pels@vu.nl

**Car sharing (e.g. greenwheels)**

An important new development is the growth in car sharing of which is very little known. We have access to data for this market. We expect you to review literature and to come up with interesting hypotheses of behaviour in this market. A quantitative analysis of these data must be part of the thesis. An internship with a large car sharing provider may be arranged.

Jos van Ommeren, j.n.van.ommeren@vu.nl and and Piet Rietveld, p.rietveld@vu.nl
Infrastructure

Problems in franchising of infrastructures

Governments frequently use auctions for selecting a firm for a “franchise” to privately operate, for example, a (high-speed) rail link, an airport, a seaport or a road. Despite the appeal of such a procedure, there are often problems with, for instance, renegotiation of the contract (by firm or government), bankrupt operators, and limited competition for the franchise. For this one could think of the problems with the high-speed rail franchise in the Netherlands, railways on the UK, and private roads in Southern Europe and Latin America.

Vincent van den Berg, v.a.c.vanden.berg@vu.nl

The economics of parking

Parking has been a field where rapid developments take place in many municipalities. Relevant aspects are the optimal size and price of parking facilities, and the potential role of the private sector to supply parking facilities.

Piet Rietveld, p.rietveld@vu.nl

Employer (paid) parking

Despite the large literature on transport, we know hardly anything about employer paid parking which is extremely relevant to understand commuting behaviour of workers. Interesting topics include: a deeper understanding why most employee parking is usually fully paid by the employer and its consequences for the economy, the distortionary effects of the tax system etc. A quantitative analysis of (international) parking data must be part of the thesis.

Jos van Ommeren, j.n.van.ommeren@vu.nl

Commercial Parking Providers (e.g. Q-Park)

Commercial parking providers have an important influence on the parking market. We expect to receive interesting data from one of the main players in the market. We expect you to review the literature and analyse data to estimate the demand elasticity for parking, the importance of providers' market power etc.

Jos van Ommeren, j.n.van.ommeren@vu.nl
Parking at the VU

Parking at the VU remains an important topic for its workers. Many years ago, an excellent thesis has been written about this. However, recently, large changes in the prices for VU workers have been announced. We expect you to analyse the effects of these changes (given availability of data).

Jos van Ommeren, j.n.van.ommeren@vu.nl and Piet Rietveld, p.rietveld@vu.nl

Parking in a city

What is the optimal parking price in a city? What is the effect of on street and offstreet parking price changes on demand? We expect you to use the newest scientific insights and to analyse data about demand for parking in one specific city (e.g. Amsterdam, Almere).

Jos van Ommeren, j.n.van.ommeren@vu.nl

Noise barriers

Noise barriers obviously have the advantage of reducing the amount of noise from roads and rail that reach a house. They have disadvantages as well however, such as blocking the view and probably also blocking daylight. The purpose of this study is to evaluate both effects and assess the factors that determine their relative magnitude. Several methods of analysis are available, such as hedonic pricing, stated choice experiments or case studies.

Mark Lijesen, m.g.lijesen@vu.nl

Choice of speeds in transport

Actual speeds are affected by decisions at various levels: companies constructing vehicles (including aircraft, ships, cars, trains), the public sector that develops infrastructure, and the drivers of vehicles. An analysis is needed to what extent environmental and safety externalities are sufficiently taken into account in these decisions.

Piet Rietveld, p.rietveld@vu.nl
Private roads

There are growing numbers of analysts and observers who propose to privatize the road system, or parts of it, in the face of growing traffic demands and congestion and inadequate public response to this. Is a privatized road system, or parts of it, viable and/or desirable?

Erik Verhoef, e.t.verhoef@vu.nl

The economic impact of infrastructure investments.

Amsterdam Airport Schiphol is often referred to as a ‘Mainport’, which allows travelers to reach a lot of destinations with direct flights, and which attracts a lot of economic activities. In order to maintain this network, indirect travel is necessary: many travelers fly to their final destination via Amsterdam. What is the added value of indirect travel via Amsterdam for the Dutch economy? What is the economic damage if Amsterdam loses its ‘Mainport’ function?

Eric Pels, a.j.h.pels@vu.nl