VU University Amsterdam

Master of Science Spatial, Transport and Environmental Economics

Limited Study Programme Assessment

Introduction

This is the assessment report of the Master of Science Spatial, Transport and Environmental Economics (STREEM) degree programme offered by VU University Amsterdam. The assessment was conducted by an audit panel compiled by Netherlands Quality Agency B.V. (NQA) commissioned by VU University Amsterdam. The panel has been compiled in consultation with the study programme and has been approved prior to the assessment process by NVAO.

In this report, the panel gives account of its findings, considerations and conclusions. The assessment was undertaken according to the *Assessment frameworks for the higher education system* of NVAO (6 December 2010) and the *NQA Protocol 2011 for limited programme assessment*.

The site visit took place on 10 and 11 October 2011.
The audit panel consisted of:
Mr. prof. R.W. Vickerman (chairperson, domain expert);
Mr. prof. dr. G.R. Allaert (domain expert);
Mr. prof. dr. A. Tukker (domain expert);
Ms. K.M.C. Lageweg (student panel member).

Mrs. ir. M. Dekker-Joziasse, NQA-auditor, acted as secretary of the panel.

The study programme offered a critical reflection; form and content were according to the requirements of the appropriate NVAO assessment framework and according to the requirements of the *NQA Protocol 2011*.
The panel studied the critical reflection and visited the study programme.
Critical reflection and all other (oral and written) information have enabled the panel to reach a deliberate judgement.

The panel declares the assessment of the study programme is carried out independently.

Utrecht, *16th of January 2012*

Panel chairman   Panel secretary

Mr. prof. R.W. Vickerman   Mrs. ir. M. Dekker-Joziasse

Summary

The Master of Science study programme Spatial Transport and Environmental Economics (STREEM) of the VU University Amsterdam receives the judgement **good**. This is based on the judgement **good** that is given for the standards 2 (Educational learning environment) and 3 (Assessment and achieved learning outcomes). Standard 1 (Intended final learning outcomes) receives the judgement **satisfactory**.

Standard 1: Intended final learning outcomes
The STREEM study programme focuses on the interaction of three subdisciplines: spatial economics, transport economics and environmental economics. This is clearly recognized in the intended learning outcomes. The panel suggests that the balance of these three sub-disciplines could be made clearer, especially with respect to the interaction with the subdiscipline of environmental economics.
The panel is impressed with the ambitions of STREEM, taking into account the relative small size of the programme. Management and staff will need a clear focus on the possibilities and opportunities to fulfill these ambitions of growth and expansion to involve international joint activities. The fact that the number of students is growing (slightly) creates space to follow up on the ambitions.
The panel finds that the programme complies with the demands of both the academic rigour and the professional fields related to the programme. The STREEM programme compares very favourably with other programmes in economics regarding current scientific practice. The programme is based on the use of state-of-the-art research and up-to-date knowledge of the disciplines.
The intended learning outcomes are refined by consultation with representatives from the appropriate fields of work (the Advisory Board). In these fields there is a clear need for alumni with knowledge and understanding in the disciplines involved in STREEM, with the ability to integrate aspects of the three sub-disciplines. Although there are no clearly defined careers, the alumni obtain interesting positions at the intended academic level in companies (KLM, Arcadis, NS/Prorail) and governmental organisations (ministry of transport).
Taking into account the small size of the STREEM programme, the panel finds that the study programme lives up to its standards. The final qualifications are adequate. To fulfill the ambition to develop the programme careful management of future activities, and expansion of student numbers will be required.

Standard 2: Teaching-learning environment
The panel finds the STREEM programme well thought out and clear in its structure. The content maps onto the intended learning outcomes. The three sub-disciplines are clearly present and students learn to master the tools to integrate and research the disciplines. The emphasis on environmental aspects is rather less than on the other sub-disciplines. The panel recommends further thought be given to this point. After the core courses in the three sub-disciplines, students can broaden or deepen their choice of subjects in the elective courses.

Students know what to expect and can receive all the necessary information and guidance. The lines of communication to staff members are short and staff members are open to questions from students.

Staff members have a clear picture of the goals of the programme and are capable of incorporating these in the delivery of the programme. From regular evaluations, discussions and staff meetings, there is good agreement about the coherence of the programme. This is formally monitored by the Programme Committee and Education Committee. The didactical methods suit the scale and the academic character of the programme. Students work in small sized groups, a guarantee for interaction and class participation.

The panel finds the quality of staff to be more than adequate. All sub-disciplines are present at the desired level. Members of the teaching staff are very experienced in research and have good connections with the relevant work fields.

Both formally (through evaluations by the Programme Committee and checks by the Education Committee) and informally (through lecturer – student contacts) there is solid input for quality assurance. The Education Committee has a signalling role. The Programme Committee can use this as an input for making improvements to the programme. Alumni state that among the teaching staff there is a great willingness to use evaluation results for the further improvement of the programme. Both lecturers and students seem to be eager to enhance performance.

The panel finds that the STREEM programme offers a good learning environment for students with good opportunities to become STREEM-professionals and –researchers. The programme and its staff challenge students. Students feel inspired and satisfied. They feel that the programme is worthwhile and useful. STREEM offers a diverse programme with many opportunities for students, if compared with other MSc programmes with low numbers of students. It is impressive how only 1.2 fte can realise almost tailor made trajectories for students.

The panel assesses the teaching-learning environment as **good** and above average compared to comparable sized MSc programmes. There are elements of excellence, especially regarding the quality of staff.

Standard 3: Assessment and achieved learning outcomes
The panel concludes from the documentation and interviews, that the study programme has overall a good system of assessment that is regularly evaluated and discussed. A variety of exams and assignments is used, that fit with the learning objectives and content of the courses. The types of exams and the exam criteria are clearly pointed out to the students in the *Study Guide* and in the explanations lecturers give during classmeetings. Students state that the examinations and the grading are clear to them and they have no complaints. Lecturers and the programme manager regularly discuss the examination and master thesis grading. This creates a platform, where lecturers exchange their experiences and fine-tune their criteria for grading. There is good quality assurance by the independent Examination Board and the regular evaluations made by the Programme Committee.

The panel finds that the study programme has a good standard for the realisation of the learning outcomes. The panel finds that students are challenged to perform well. Independence is clearly an important factor.

From scrutiny of 15 theses, the panel concludes that the subject of the theses fit with the content and aims of the programme. The examiners use a rigorous standard when grading the theses. The higher quality projects and the more complex projects do receive the highest grades. All theses are acceptable for the standards set for an academic master's programme.

The work field is eager for alumni and alumni are able to find good positions in the work field. The formal assurance by the Examination Board is organized according to the legal requirements. The Programme Committee keeps good track of performance by means of regular evaluations of courses and the programme as a whole.

The panel finds that the study programme has a good organization for the examinations and for the thesis phase. The small size of the programme works beneficially. The lines of communication between students, lecturers and programme management are short and clear. Communication is direct and there are few discrepancies in expectations regarding examinations and grading. The final qualifications of alumni are **good** and clearly meet the standards and this is monitored and examined in a fair and rigorous manner.

Contents

1 Basic data of the study programme

Administrative data of the study programme

1.	Name study programme as in CROHO	Master of Science in Spatial, Transport and Environmental Economics (STREEM)
2.	Registration number in CROHO	60444
3.	Orientation and level study programme	academic; master
4.	Number of study credits	60 EC
5.	Graduation courses / 'tracks'	
6.	Variant(s)	Fulltime
7.	Location(s)	Amsterdam
8.	AD study programme*	Not applicable
9.	Registration number in CROHO	Not applicable
10.	Previous year of audit visit and date decision NVAO	Previous audit visit: 8 December 2006 Decision NVAO: 12 February 2007

*) Associate Degree, if applicable

Administrative institutional data

11.	Name institute	VU University Amsterdam
12.	Status institute	Funded
13.	Result institute audit	Scheduled for spring 2013
14.	Code of conduct higher education	Signed, since 2006

Substantive information on the study programme

15.	*Substantive profile study programme* The MSc in Spatial, Transport and Environmental Economics provides a high-quality academic education. Students who have obtained the MSc degree possess a thorough knowledge of modern general economic theory and especially of spatial economics, which encompasses here the related sub-disciplines of regional, urban, transport and environmental economics. Students will be able to apply the theory to spatial economics policy questions. Moreover, they will be able to independently formulate relevant research questions, set up and carry out research and to report and present the results in written and oral form. The programme also pays extensive attention to empirical and quantitative knowledge and skills at an academic level and relates them to the relevant spatial economic theories. The ultimate goal is that students are able to independently carry out empirical research, which is adequately based on theory and uses up-to-date methods. *(STREEM self evaluation report page 8)*
16.	*Intended professional field alumni* *There is an increasing demand for professionals with up-to-date knowledge of the economic dimension of current spatial, transport and environmental problems. Society urgently needs experts who are able to carry out cost-benefit analyses of spatial policy in general and investments in expensive traffic and transport infrastructure in particular, and who are able to play a leading role in the socioeconomic debate on and agenda-setting in relation to these issues.*

The increasing complexity of society creates a need for specialists with an academic background in economics and good knowledge of related disciplines who are able to develop scientifically sound alternatives, evaluate them and establish the boundaries early on within which the solutions have to be found. In the private sector too there is a growing need for professionals with a spatial economics background. Large transport companies such as KLM, Schiphol Group and NS (Netherlands Rail) are major examples, but a spatial economics orientation is also important in areas such as banking, real estate and chambers of commerce. (STREEM self evaluation report page 7)

17. *Place study programme in organisation structure of the institute*

The MSc programme Spatial Transport and Environmental Economics is part of the Faculty of Economics and Business Administration (FEWEB) of VU University Amsterdam. The Faculty has approximately 5400 degree students and 1600 executive students. FEWEB offers four BSc and seven MSc degree programmes. All BSc programmes take three years, all regular MSc programmes one year. The seven MSc programmes are organized into the FEWEB Graduate School. FEWEB also offers two-year MPhil programmes in Economics and Finance, but does this through the Tinbergen Institute.

Organisation by discipline. The Faculty is governed by the Faculty Board, made up of the dean, the director of education and the director of research. These three bear joint responsibility but ultimately the dean is accountable to the university's executive board. The Faculty has a managing director for all administrative matters. The FEWEB academic staff is divided into departments, each of which is headed and managed by a professor. The Heads of Department are accountable to the Faculty Board. The Faculty Student Board and the Faculty staff council are representative advisory bodies.

Organization by teaching programme. Each BSc and MSc programme has its own Programme Management that is responsible for the content, organisation and quality assurance of the programme. The Programme Management reports to the Faculty Board. For staffing the programmes they draw on the scientific departments who have the authority to assign staff to specific tasks within the degree programmes. The Director of Education can, however, overrule these assignment decisions in the larger interest of the Faculty.

18. *Major changes in study programme since last visit*

There have been no major changes in the programme. Worth mentioning is the change in focus in the field course on environmental economics from international environmental economics to climate change. Furthermore, the GIS course has been rescheduled such that it is now offered over two periods making it more feasible for students to take this course as an optional course. In view of the broad applicability of GIS, this is a change that is appreciated by the students. A final change is that the research project and the thesis have become more integrated than in the initial curriculum. Students are now strongly advised to use the research project as a means to prepare the literature review for their MSc thesis.

Quantitative data regarding the study programme

1. In - through- and out-stream data of – if possible – the last six cohorts
2. realized student-teacher ratio
3. average number of face-to-face instruction hours[1] per phase of the study (a phase can be denoted in regular academic years, the internship and the graduation period).

Incoming students STREEM (1 October 2010)			
cohort	Study year	Total	International students (%)
2007	2007/2008	9	67
2008	2008/2009	13	46
2009	2009/2010	10	30
2010	2010/2011	17	41
2011	2011/2012	25	52

	Cohort size: 9	After 1 year		After 2 years	
		cum	%	cum	%
Cohort 2007	master's STREEM completed	3	38	7	78
	Discontinued	2	25	2	22
	Still in master's STREEM	4	50	0	0

	Cohort size: 13	After 1 year		After 2 years		After 3 years	
		cum	%	cum	%	cum	%
Cohort 2008	master's STREEM completed	8	62	11	85	12	92
	Discontinued	1	8	1	8	1	8
	Still in master's STREEM	4	31	1	8	0	0

	Cohort size: 10	After 1 year	
		cum	%
Cohort 2009	master's STREEM completed	7	70
	Discontinued	0	0
	Still in master's STREEM	3	30

STREEM	fte education	Students in programme	Ratio
2007/2008	1.17	9	1 : 8
2008/2009	1.32	17	1 : 13
2009/2010	1.2	14	1 : 12
2010/2011	1.17	22	1 : 19

Average number of contact hours
In period 1, 2 and 4, students follow on average two courses per period. Each course has on average 6 contact hours per week resulting in a total averige number of 12 contact hours per week.

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[1] The study programme uses a definition for face-to-face instruction hour of 45 minutes.

In periods 3, 5 and 6, students work on their research project (in period 3) and master's thesis (periods 5 and 6). These activities are supervised by a daily supervisor who meets students on average once a week for about an hour. In addition, there are thesis classes every second week where students present the set-up, progress, draft version and also final version of their work. These sessions usually last 3-4 hours. Thus, the number of contact hours in these periods is on average 3 hours a week. In addition, practical questions arising during the process of writing up the research project and master's thesis can be addressed through regular email contact.

2   Assessment

The panel describes the findings, considerations and conclusions of each standard of the NVAO assessment framework. The final judgement concerning the study programme will be presented in chapter 3.

Introduction to the STREEM study programme
The scientific domain of spatial economics consists of three closely related sub-disciplines: regional and urban economics, transport economics and environmental economics. Spatial economics (STREEM) combines the three disciplines and covers complicated policy problems that require sound analysis in a complex setting. Key factors are spatial development, traffic and transport and the environment. Relationships have to be analysed between diverse phenomena such as urbanization, economics, migration, trade, infrastructure, location choice, accessibility, environment and safety. Analysis is often based on methods from the modern microeconomic and econometric toolboxes. The spatial economist has a good knowledge of these techniques and can use them independently to study policy problems. Spatial economics specialists should (1) be able to deal with socioeconomic and spatial economics questions at a scientific and professional level, (2) have a thorough understanding of the economic exploitation, spatial planning and organization of our natural environment, urban and transport networks and their interactions and (3) develop creative solutions for the numerous problems in that broad field in the Netherlands as well as elsewhere.

Standard 1   Intended final learning outcomes

> *The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.*

Findings
After completion of the programme the students should be able to carry out independent research in spatial economics and be able to analyse complex problems concerning at least two of the three interrelated sub-disciplines, taking into account multidisciplinary aspects and policy measures. The programme should provide students access to high-quality PhD positions in the field of spatial economics and jobs in the public and private domains.
To fulfil this, students have to obtain a thorough knowledge of modern general economic theory and more specifically the three sub-disciplines. Students have to apply the theory to spatial economic policy questions. They have to independently formulate research questions, set up and carry out research and report and present the outcomes in written and oral form. Extensive attention is given in the programme to empirical and quantitative knowledge and skills at an academic level. Students must be able to carry out empirical research which is based on theory and uses up-to-date methods.

The intended final attainment levels are described in annex 1. These attainment levels are closely related to those in the MSc Economics programme at the same Faculty. The relationship with the Dublin Descriptors is clearly described. There is a clear relationship with academic aspects, for example:
- the academic research context,
- the ability to independently set up, carry out and report regarding scientific research,
- the multidisciplinary setting in the combination of the three sub-disciplines,
- the ability to handle problems/questions in unfamiliar settings in professional practice,
- the expected academic level of thinking and ability to integrate knowledge and handle complex questions often with incomplete data,
- the ability to access and analyse academic literature, judging its relevance and applying it in the daily professional practice.

Overall the STREEM programme is seen as one of the most international master programme of the VU University, because of the mix of nationalities of incoming students, and the use of English as the language of instruction throughout the programme.
The STREEM programme is unique, both nationally and internationally, because of the emphasis on the interaction between the three sub-disciplines and the emphasis on the use of economic analysis. By subdiscipline the study programme compares well with other related programmes, nationally and internationally. The main comparators are: masterprogrammes of the University of Leeds (Transport Economics), the Swedish Royal Institute of Technology in Stockholm (Transport and Spatial/Urban Planning) and the Department of Geography and Environment at the London School of Economics (Environmental economics). There are plans for a joint Master's programme and/or exchange of courses with Leeds and Stockholm, based on existing contacts between staff. These plans are in the early stages, due in part to available staff resources, and have to be worked out in the coming years. The intention is to offer at least a half year abroad under an Erasmus Mundus programme.

The STREEM programme has an Advisory Board which includes representatives from the working fields of potential future employers to guarantee the relevance of the programme. The connection with the job market is also discussed in the Advisory Board.There is a growing need for scientifically educated professionals who are able to contribute to the development of policy and scientific knowledge in spatial, transport and environmental economics. Firms and government ministries offer internships to students for carrying out research and writing their theses. The growing alumni network will also be used for obtaining more internships and a closer connection to the international working field.
The audit panel believes the connections with the fields of work can be further improved and intensified and made more visible during the study programme itself, for instance through guest lecturers from the working field. This will be beneficial for students, because there are no set positions in the fields of work for STREEM-alumni. Firms do not always know what to expect of alumni and alumni have to establish their positions.

Considerations
The audit panel has studied the final qualifications of the STREEM programme. The panel finds them relevant to the domain of the study programme. All three sub-disciplines are recognized and put in perspective. In the fields of work there is a clear need for alumni with knowledge and understanding in the disciplines involved in STREEM at an academic level, although positions and jobs are not always clearly defined.

The ambitions for the development of the programme will require considerable effort. The panel recognizes that, taking into account the relatively small size of the programme management and staff will need a clear focus of the possibilities and opportunities to fulfill these ambitions. The fact that the number of students is growing (slightly) creates space to follow up on the ambitions.

The panel finds that the programme complies with the demands of both the academic rigour and the professional fields related to the programme. The panel is of the opinion that the STREEM programme compares very favourably with other programmes in economics regarding current scientific practice. The programme is based on state-of-the-art research and up-to-date knowledge of the disciplines. The balance between the three subdisciplines could be set out more clearly in the learning outcomes, especially with regard to environmental economics.

The alignment with the fields of work gives clear input for further development of the programme. In the fields of work there is a need for academics that have the ability to integrate aspects of the three subdisciplines. Although there are no clearly defined positions in the fields of work, the alumni obtain interesting positions at the intended academic level in companies and governmental organisations.

Despite it's small scale the panel finds that STREEM lives up to its standards. The final qualifications are adequate. To fulfill all the stated ambitions will require careful management of activities. This depends on future student numbers and related funding.

Overall the panel finds that the STREEM programme fulfills the demands for an academic master programme with its final qualifications.

Conclusion
Based on above-mentioned considerations the audit team comes to the judgement **satisfactory.**

Standard 2   Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Findings

Contents of the curriculum
-   Link between the intended learning outcomes and the contents of the curriculum
The structure of the programme is clearly stated in the Self Evaluation Report. The programme starts with the basic building blocks of spatial economics.

These two courses are partly delivered independently from the MSc STREEM and provide students with a knowledge of microeconomics methodology and research methods required for later courses. The first half of each course deals with general economic concepts and the second half focuses on spatial economics aspects. Students find these introductory courses demanding. They point out that the link with spatial economics and with the STREEM programme is not always clear. The study programme acknowleged this and pointed out that, with a growing number of students, they want to offer these two courses independently, thus resulting in a better fine tuning of the content of these courses to other STREEM courses and establishing a closer relationship with STREEM students from the beginning. The panel finds the programme well structured. All expected elements are present. Students have the opportunity to specialise in a sub-discipline or to have a broad focus. The logical order of modules can always be debated, but for students and lecturers the set up and the coherence is clear. The relationship between modules is regularly discussed amongst lecturers and addressed in class. The connections between certain topics are made clear. It was noted that the interaction with environmental subjects is less strong than between the urban and transport subjects.

The relationship between courses and the attainment level is not clearly presented in the Self Evaluation Report. From discussions with lecturers and students the panel is convinced that the relationship is clear to all participants and could be set out more clearly on paper. Lecturers tune the course structure with the attainment levels. The structure is discussed with the programme manager and in the Education Committee.

- Knowledge & skills and structure of the programme

The STREEM programme starts with the basic building blocks of spatial economics in period 1, extends with more specialized and subfield-specific knowledge and skills in periods 2, 3 and 4 and integrates all (chosen) elements into the Master's thesis in periods 5 and 6. Students appreciate the clear structure of the programme, with its possibilities for variety through electives. Diverse teaching methods are used: conventional lectures, working groups with individual and group assignments, presentations, seminars and tutorials. Each lecturer has to justify the structure and content of a course to the programme manager and the Education Committee. Because of the small scale of the programme the communication lines are short and adjustments can be made quickly and effectively.

The study programme uses international graduate textbooks by renowned authors and recent research papers from top journals are discussed in seminars and in the courses. The panel finds the literature up-to-date and dealing with state-of-the-art research topics. This is clearly due to the fact that the teaching staff are all specialized researchers in the fields in which they teach. Most literature is provided to the students by staff on Blackboard. But in the research project, as preparation for the thesis, students have to perform their own literature research.

When necessary guest lecturers in applied spatial economics are invited to teach specialized applied topics or to give students a perspective of job/career possibilities. This is appreciated by students and alumni. Students indicated they would like to see even more of this. Students and alumi are positive regarding the possibility to do the thesis during an internship.

Students stay half a year working and researching in a company or institution. This is sometimes hard to organize and STREEM has to check regularly with the company and the student if the intended (learning) goals and the choice of subject are still appropriate or have to be adjusted. The panel is positive regarding the fact that the internship offers students an insight into the fields of work and enhances the job opportunities for students. Students and alumni have mentioned this as a point of attention.

The STREEM programme is ranked by students with an average of 4.63 (scale 1 to 5) for quality, quantity, viability and relevance. It is among the best performing economics research groups in the Netherlands, according to a QANU audit. In the NSE the programme is also highly appreciated: 3.69 for content, 3.96 for general skills and 4.09 for academic skills. Only the preparation for the work field has a below average score, 2.9. This is explained by the fact that there are no concrete defined jobs. Alumni have to secure their positions on the basis of their qualities.

Students and alumni address the studyload. At the start, the two introductory courses are regarded as demanding, because of the difficult quantitative subjects. After three weeks of general knowledge, the application to spatial economics is more interesting. Students regard the topics as more useful then. Students have the feeling they have to struggle through the first few weeks. They often miss the link with their previous education. The extra introduction course to mathematics is often necessary. After that the study programme is more manageable regarding study load, as long as students stick to the programmed two courses per period. After that the study load is realistic. In the national student's survey a score of 3.33 (scale 1 to 5) is given for the study load. Students indicate that the core courses fit with the expected study load of 6 EC. The introductory courses are perceived as more demanding, depending on the previous education and experience of students. The elective courses are sometimes perceived as less demanding. This might be the result of the fact that students then follow their own choice and interest and are almost automatically inclined to put more effort in assignments. Overall the indicated study load is realistic for the study programme as a whole.

Students mention that they are tought to be good 'technicians'. They learn to work with real data and apply mathematics and economics methods rather mechanically. The aim is on analysis and problem solving. Attention for more interpretation could be a focuspoint for better preparing the student for the Master's thesis. This point is already encountered in the Geographic Information Systems course, which is an elective course.
The panel has discussed the path from research project to thesis. It sometimes seems more logical if those two periods would follow directly after each other. But the study programme clearly has motives to separate both periods with an elective course block in between. Students can realize after the research project that they want to change or adjust their choice of research topic. Sometimes they can deepen and focus their knowlegde and skills during the elective block and become better prepared for the actual research in the Master's thesis. Also students can get more stimuli from the course in between which influences the focus and structure of the thesis.

The study programme as a whole is monitored by the Education Committee. The Education Committee (three lecturers and three students) monitors all courses and at the end of each year the whole study programme. Evaluation results are used in discussions in staff meetings regarding the structure of the study programme and the contents of the different courses. Lecturers discuss the outcome of evaluations and use these discussions as a peer review. If necessary, adjustments to the programme are made. Small adjustments are made by teachers themselves. In case of larger adjustments the Programme Committee makes suggestions regarding content and coherence. The Faculty Board has to approve these changes on the basis of checks and balances. The yearly SWOT analysis that is made by students in the Education Committee is also included in the considerations. Since 2006 no major changes have been made in the structure of the study programme. Improvements have been made for example with the introduction of the elective GIS course in periods 2 and 4. Students acknowledge the changes made on basis of the SWOT.

- Didactic concept and methods

From documentation and discussions with staff and students the panel finds the didactic concept and methods fitting for an academic master's programme. Students are generally organised in small groups, that have direct interaction with the lecturers. The assignments are realistic and related to future professional situations. Reflection and independent thinking are clearly reoccuring elements that support the development of academic research skills. Students indicate that the group work and the debates in class are positive and necessary for developing academic skills. The groups are diverse in composition which enriches the debates. Students need to exchange different points of view in order to understand the issues that are raised.

The panel finds the ways of teaching appropriate and well thought through. There is a clear coherence in the study programme and there is wilingness among students and staff to discuss the set up of the programme and to amend it if necessary. The way that lecturers are constantly looking for improvements is a positive asset to the programme.

- Student supervision

The intake of students is very diverse and more heterogenous than with other masterprogrammes. A consequence is that some students have to work harder than others, especially with the introductory courses microeconomics and research methods.

The first six weeks require students to attain a threshold. The first courses are designed to ensure that students approach the remainder of the programme on a level playing field. Students with a BSc in a domain sufficiently related to economics, but with minor deficiencies in their knowledge of microeconomics or econometrics, can enter a self-study programme. This programme is also open to students who need a refresher in microeconomics or econometrics or one of the sub-disciplines of spatial economics.

Students are advised to study five standard starter textbooks (required reading bachelor level) during the summer months. Mastery of this material is required for successful participation. Assignments and practice exams are available on request. Extra tutorials are offered in the first week of the first period. In the first week preceding the start of the academic year, students can also follow a Maths Refresher course. Bachelors from the study programme Earth&Economics are only directly admitted if they have taken the Economics

minor. Foreign students often are more experienced in research. During intake they have to pass a rather tough selection on mathematics. Students have to complete a certified English language test at the level of 6.5 for IELTS or 580 TOEFL before beginning the programme. Overall 20 to 30 percent of applicants is rejected by the Admissions Board.

During the programme the set up of trajectory tracks of foreign students can differ from those of Dutch students. This is a result of the fact that most foreign students have to finish their study within a year for financial reasons or because of their visa or duties back home. Dutch students often have more possibilities to extend their study period. Sometimes groups split up and foreign students more often follow individual trajectories. This is closely monitored by supervisors. At the start they have regular meetings with students to follow students progress and study results. During the year the frequency of counseling depends on the student's initiative. Students become more responsible for their own progress. Students with difficulties in the private sphere or related to the programme can also visit the Study Advisors, for example in case of a specific disability.

The panel finds that student counseling is as might be expected. Lecturers and study counselors have good care and attention for students that struggle, specifically at the start of the programme. During the programme students have to show more independence. Students that require too much coaching in the thesis phase, receive lower final grades.
Overall studens are satisfied regarding the information services (3.3), the information they receive (3.6) and the student counselling (3.6).

Staff quality
The MSc STREEM programme is primarily taught by staff members from the Department of Spatial Economics. All lecturers are involved in research and education. Over 75% of the Departments staff has a PhD. Among the lecturers in the STREEM programme there are nine staff members holding a Full Professor (hoogleraar) position, two are Associate Professor (Universitair Hoofddocent), three are Assistant Professor (Universitair docent) and two have research positions.
Furthermore a substantial group of national and international guest researchers are involved in the Department. Several staff memebers also have part-time positions at other highly ranked institutes (e.g. Tinbergen Institute, CPB, Netherlands Bureau for Economic Policy Analysis, Ecorys). Staff members are involved in both fundamental and applied national and international research, which offers insight from a multidisciplinary perspective.
Several staff members have received awards and prizes like the the ERC Advanced Investigators Grant 2009 and 2010, a RSAI[2] Fellow title, an EIB-ERSA[3] prize.
The Department of Spatial Economics is recognized worldwide as a leading centre of research expertise. The Department of Spatial Economics is ranked highest on the REPEC[4] list of departments in economics in the Netherlands. Four of the staff members are rated in the top 40 on the annual ESB[5] list of most productive economists in the Netherlands.

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[2] RSAI Fellow: a honorary title for distinguished scholars in the field of regional science
[3] EIB-ERSA: European Investment Bank-European Regional Science Association
[4] REPEC: Research Papers in Economics
[5] ESB: Economisch Statistische Berichten

The department hosts a Spinoza-prize winner and has two ERC advanced grant winning projects. Prof. Rietveld is nominated as a fellow of Academia Europaea in 2010 and as a KNAW member in 2011. Staffmembers participate on the editorial boards of a substantial number of leading journals in their respective fields.

All teaching staff with a permanent contract meet the national Basic Teaching Qualifications (BKO) requirements. They have either completed the university lecturer training or have demonstrable competences acquired elsewhere. Junior lecturers are coached by senior lecturers. All staff must have English proficiency at the C1 level of the Common European Framework.

The panel finds the quality of staff above standard, near excellent. There is a good mix of professors and assistant professors, internal and external educated and trained. Staff members have outstanding records in their fields of expertise. Staff quality is awarded by students with a score of 4.25 (scale 1 to 5) in student evaluations. Lecturers are very approachable to students. Alumni state that staff members have good connections to local companies and therefore can bridge the gap between theoretical research and applied research; which fits the structure of the programme perfectly.

The quality of staff is monitored regularly. For example, once a teacher received bad grading for his teaching skills in a course evaluation. This was noticed and this lecturer received training and should perform better next time. This indicates that the programme management upholds good standards for its lecturers and intervened in the situation.

The panel has found that STREEM has an experienced team of lecturers. The panel compliments the team for it's enthusiasm and passion for the study programme. The staff is willing to go beyond normal tasks and hours input. They contribute more time than student numbers can account for. The input of voluntary, unpaid hours has kept the programme going with such good quality.

Quality of study programme-specific facilities

Facilities such as classrooms, library, computer labs and databases are organized at Faculty or University level. Special features for the STREEM programme are the close relationship with SPINLab (Spatial Information Laboratory) and the special Geographical Information Systems software and databases that are made available to students.

In course and programme evaluations students gave scores 2.2 for housing facilities and 3.5 for programme specific facilities.

During the first courses (department level) there was not always enough working space for student(groups). During later courses students are more inclined to work in the STREEM-wing of the building. Furthermore they get more familiar with the facilities.

The panel finds the programme specific facilities good and there is a good network of facilities. For example, the GIS-lab is woven into several courses.

Coherent educational learning environment

The panel finds the STREEM programme well thought out and clear in its set up. Students know what to expect and can receive all the necessary information and guidance. Staff members have a clear picture of the goals of the programme and are capable of incorporating these in the delivery of the programme. There is good agreement about the coherence of the programme and this is regularly discussed during staff meetings and in the

Programme Committee and Education Committee. The didactical methods agree with the small size scale and the academic character of the programme. Students are well trained in their individual development and skills to perform research.

The content of the programme suits the attainment levels. All three sub-disciplines are present in the programme and students learn to master the tools to integrate the disciplines. The interaction with the environmental aspects could be given more emphasis; whilst the other two programme elements urban and transport economics are by the nature of the subject already closely related.

The panel finds the quality of staff to be more than adequate. All sub-disciplines are present at the desired level. Members of the teaching staff are very experienced in research and have good connections with the relevant fields of work. This fits with the goals and purposes of the STREEM programme.

The STREEM programme has both a formal and an informal quality assurance system. Formally, the Programme Committee and the Educational Committee have a central role in keeping the programme up to standard. The Programme Committee (three core lecturers) is responsible for the structure, content, coherence and academic level of the programme. The Education Committee (three lecturers and three students) has the key position in the quality assurance. There the outcomes of course and programme evaluations are collected and discussed. The Education Committee also checks the Academic & Examination Regulations. The Education Committee has a signalling role. The Programme Committee can use this as an input for making improvements to the programme. Alumni state that among the teaching staff there is a great willingness to use evaluation results for the further improvement of the programme. Both lecturers and students seem to be eager to enhance performance.

Considerations

All in all the panel finds that the STREEM programme offers a good learning environment for students with good opportunity to become STREEM-professionals and –researchers. The programme and its staff challenge students. Students feel inspired and satisfied. They feel that the programme is worthwhile and useful. STREEM offers a diverse programme with many opportunities for students, if compared with other MSc programmes with small numbers. It is impressive how only 1.2 fte can realise almost tailor-made trajectories for students.

The panel assesses the teaching-learning environment as good and above average compared to comparable sized masters programmes. There are elements of excellence, especially regarding the quality of staff.

Conclusion

Based on above-mentioned considerations the audit team comes to the judgement ***good.***

Standard 3   Assessment and achieved learning outcomes

> *The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.*

Findings

Assessment system

Regarding the examination system, STREEM works according to the *Academic & Examination Regulations (OER) Academic year 2011-2012* for all master's degree programmes of the Faculty of Economics and Business Administration. A variety of forms of assessment is used. The assessment for each module is described in the Study Guide. The lecturer proposes a certain type of exam and the programme manager monitors if this is appropriate. Many of the assignments and exams are problem oriented.

In the methodological core courses both group and individual assignments are used. Both courses are concluded with a written exam. The final mark is the weighted average of the assessment marks and the written exam. The spatial core courses make use of assignments, seminars and written exams. The seminars allow greater in-depth discussion and analysis. They are concluded with a written report and oral presentation. The assignments account for 20-40% of the final mark. Specialization courses also make use of concrete case studies and are concluded with written exams. The final mark is the weighted average of the written exam and the assignments/case studies. Research project and thesis are both concluded with a written report and an oral presentation and discussion. Both are assessed on the basis of a standard list of criteria for the quality of the content and the quality of the presentation. Grades are determined independently by the daily supervisor and always a second examiner, usually the coordinator of the thesis class. The second examiner guarantees a proper benchmarking of individual theses. If both examiners cannot reach a consensus, the head of department takes the final decision on the grade.

The panel has studied a cross section of assignments, research project reports and exams. The panel finds it positive that the study programme uses a variety of exams fitting with the character of the modules. Each lecturer chooses the most appropriate form of assessment that fits the learning goals. The panel compliments the fact that no multiple-choice exams are used. The exams set out to test the knowledge and skills of students and their ability to apply this to practical situations with scientifically underpinned solutions.

With the written exams each student has to show his/her personal competencies with every module. Lecturers match the outcomes to the skills the student has to master. Students know beforehand, from the information in the Study Guide and the comments from lecturers, what to expect from assignments and exams. They rarely experience any surprises. Students receive feedback (written or oral) regarding their achievements and their development as a professional. Students may inspect all written exams and they can ask for the answer form. This is one of the latest improvements as a result from the course evaluations by the Programme Committee. Overall the examination is rated with a score of 3.67 (scale 1 to 5) in the NSE.

The panel finds that the grading is fair and accurate. Examiners have a good eye for the boundary between sufficient and insufficient. A grade 9 is exceptional.

The panel noticed that the feedback on several examination forms is minimal and could be more explicit. It is not always clear how points and comments are related to certain grades. Students state that they receive more feedback when they discuss the exam with lecturers. This depends on the initiative of students and is not always the case.

The quality of the exams is guaranteed by several checks and balances. First of all, all teaching staff are trained to develop appropriate exams and assignments. The central concern is the composition of a balanced representative exam linking the questions to the learning objectives. Furthermore, all exams are composed (or checked) by at least two examiners before they are submitted to the study secretariat. After the examination a statistical test on the quality of the exam is performed. Complaints can be discussed with the examiner. In case no consensus is reached, students can submit a formal complaint to the Examination Board. The quality of the exams is evaluated by the Education Committee. The Examination Board (Department of Economics) randomly selects seven exams per period which are evaluated ex post.

From the documentation and discussion with examiners and Examination Board and Education Committee the panel finds that the quality of exams is seriously monitored by all parties concerned. Lecturers have peer reviews while composing exams and evaluate exams afterwards. Exams are subject to the course evaluations by the Education Board. The Examination Board operates for all economics degree programmes and operates independently of the STREEM programme. The chairman is deployed from the Department of Finance and specialised in psychometrics, is experienced with exam analysis. If 80 percent of students fail a particular exam and there are formal complaints, that exam is checked and discussed. The Examination Board decides on individual requests regarding resist, complaints or extra opportunities for exams. Normally there is one resit per course per academic year. For foreign students sometimes extra resits are organised to avoid unnecessary delays reagarding visas or funding. The Examination Board checks the rules and regulations every six weeks and surveys the exam quality.

This task will be expanded according to the changes in legislation (WHW), starting with the monitoring of six to eight randomly selected exams per period.

Realisation of the intended learning outcomes
All modules contribute to the development of the competencies. From the modules students often pick a topic for their thesis of they can choose a topic from a standard list. Students can make an initial start on their thesis in the Research Project. There they learn how to conduct a literature research on their topic and report on it. Students must identify around ten key scientific papers (approximately 250 pages) around a chosen topic. They learn to formulate a research question to reflect on the papers and put them in perspective. They have to write a coherent and critical evaluation, with the essence, the weak and strong aspects, differences in insight and possible issues for further analysis. This literature research can serve as a first outline for the Master's thesis. Sometimes students realise they have to adjust or change their topic before they start their thesis. Students regard the research project as a good stepping-stone for their thesis research and a good exercise for writing a sound scientific research report. From studying several research project reports the panel can confirm that students learn to master the skills and knowledge necessary for doing research.

The ultimate test whether students have achieved the attainment levels is the Master's thesis. Lecturers state that the thesis aims at the application of the methods learned, and at reflection. Students have to hand in their research proposal and their preference for supervisor for approval. In case of internships the goals must fit with the learning goals and kept in balance with the goals of the company. Objectives, regulations and planning of the thesis are given in the *Guidelines Thesis Class Spatial Economics*.

In the last four years 35 students have graduated. The panel has examined 15 of these theses, ranging in marking from 6 to 9. Before the auditvisit STREEM selected 4 theses in a range of grading 6 to 9. The panel has held interviews with the four alumni in casu and their examiners to get a clear view on the thesis phase and the final results (see annex 4). The panel also selected 12 theses beforehand to be examined by the panel (see annex 6). From studying these theses the panel finds that the right elements are in place with the students. Theses mostly focus on one of the three sub-disciplines, integrating aspects of the other disciplines. Integration of all three disciplines is not the primary goal, because this is hardly feasible in the given timeframe, but the aim is to give students a basis that allows them full integration in their future careers. The oral presentation and defence were included in the final mark.

All theses the panel has studied, meet the standard for an academic master's thesis. The panel found one questionable thesis graded with a 6. This thesis was specifically discussed with the examiners. They explained the process, where the student needed a considerable amount of supervision to produce a basic and acceptable report. This was compensated with a good oral presentation and defence.

The theses were clear and displayed well worked out problem definitions, subjects were relevant to the specialisation/sub-disciplines, research methods were substantiated, relevant literature was used (usually international), conclusions were linked to the problem definition and implications for companies or institutes were worked out. There was a clear insistence on high technical standards of economics training coupled with practical applications across three related areas.

In the lower graded theses these aspects were clearly less developed than in the higher graded theses. Thus the diversity in grading is correct and fair. It was clear to the panel that students with more complex subjects and a better performance, did receive higher gradings. A grade 9 is only given on exceptional occasions, in case of state of the art research. A 6 was often given if the independence of the student was weak or students used traditional applications and there was less analysis and the thesis was less innovative or original. Theses with a grade 6 were also more descriptive, with less data-analysis and less literature research. The gradings with elaborate explanations were very clear in the weight of factors leading to the final grade. Plagiarism is standardly checked. Theses are uploaded in a software programme to detect plagiarism.

Other indicators for the achieved attainment level are the number of students that performed an excellent thesis and have applied for PhD positions. Other indicators are the number of scientific publications that have come out of theses, the positions that alumni hold and the opinion of companies and institutes in the work field regarding the competencies of alumni.

The panel finds that 20 percent of the alumni enter(ed) in PhD positions at different universities. This is a high percentage and indicative of the level of attainment. Several theses have led to publication of articles in scientific journals or the award of grants. Students end up working in appropriate positions in renowned institutes. The programme management receives positive feedback from these contacts.

Feedback from the work field is collected through regular contact with companies, alumni and from the Advisory Board (representatives from potential employers). In the yearly meeting with the Advisory Board the need for students with a STREEM background is discussed. The minutes of the meeting show that it is also a discussion whether the programme should focus on preparing students for research careers (PhD) or for advise/research positions in the fields of work.

The panel has one point of attention. In the Self Evaluation Report there is mention of a discussion class (optional pool of discussants) parallel to the thesis, that students can join to discuss each others approach to the thesis. From the interviews the panel concludes that not many students participate and benefit from these group discussions. More students could benefit from the discussion sessions to receive and give tips to each other and thus learn to think objectively regarding their research approach.

Considerations
The panel concludes from the documentation and interviews, that the study programme has overall a good system of assessment that is regularly evaluated and discussed. A variety of exams and assignments is used, that fit with the learning objectives and content of the courses. The form of exam and the exam criteria are clearly pointed out to the students in the Study Guide and the explanations lecturers give during classmeetings. Lecturers and the programme manager regularly discuss the examination and master thesis grading. This creates a platform, where lecturers exchange their experiences and fine tune their criteria for gradings. There is good formal assurance by means of the independent Examination Board and the regular evaluations made by the Programme Committee. Students state that the examinations and the grading are clear to them and they have no complaints.

The panel finds that the study programme has a good standard for the realisation of the learning outcomes. Students know what to expect from the master thesis phase. The panel finds that students are challenged to perform well. Independence is clearly an important factor. Students receive proper guidance, without being pampered. The panel concludes that the subject of the theses fit with the content and aims of the programme. The examiners use a rigorous and appropriate standard while grading the theses. The higher quality projects and the more complex projects did receive the highest grades. All theses are acceptable for the standards set for an academic master's programme. The work field is eager for alumni and alumni are able to find good positions in the work field. The formal assurance by the Examination Board is organized to conform to the legal demands. The Programme Committee keeps good track of the performances by means of regular evaluations of courses and the programme as a whole.

The panel finds that the study programme has a good organization for the examinations and for the thesis phase. The small size of the programme works beneficially. The lines of communication between students, lecturers and programme management are short and clear. There are few discrepancies in expectations regarding examinations and grading. The final qualifications of alumni are good, clearly meet the standards and are above average. Some are outstanding and publishable. The panel comes to this conclusion on the basis of the quality of the theses reviewed, the fact that 20 percent of the alumni end up in PhD positions, and that alumni qualify with apparent ease for the types of jobs that were intended to be accessible via this Masters programme.

Conclusion
Based on above-mentioned considerations the audit team comes to the judgement ***good.***

3   Final judgement of the study programme

Assessments of the standards

The audit team comes to the following judgements with regard to the standards:

Standard	Assessment
1 Intended learning outcomes	Satisfactory
2 Teaching-learning environment	Good
3 Assessment and achieved learning outcomes	Good

Considerations

According to the standards and assessment rules of the NVAO, the final conclusion regarding the STREEM MSc study programme is 'good'. The judgements comply with the demands: at least two standards are judged "good"; one of these must be standard three.

Conclusion

The audit panel asseses the quality of the Master of Science study programme Spatial, Transport and Environmental Economics (STREEM) of the VU University Amsterdam as ***good.***

4   Recommendations

Standard 1:
The panel recognised the problems in dealing with all three areas of an ambitious programme equally. On the basis of its observations and following the discussions with both students and academic staff the panel recommends that some further thought is given on the balance of the three sub-disciplines, especially with respect to the interaction with the sub-discipline of environmental economics.

Standard 2:
The panel recommends a separate microeconomics course for STREEM students to provide a more supportive environment for those without the benefit of an undergraduate degree purely in economics and to ensure that students can then benefit from the remainder of the programme.

Standard 3:
The panel was impressed by the opportunity afforded for students to participate in mutual discussion of each other's project work, but disappointed by the apparently low level of take up of this as a voluntary exercise. The panel recommends strongly that participation in this should be made compulsory as a valuable feature of the programme.
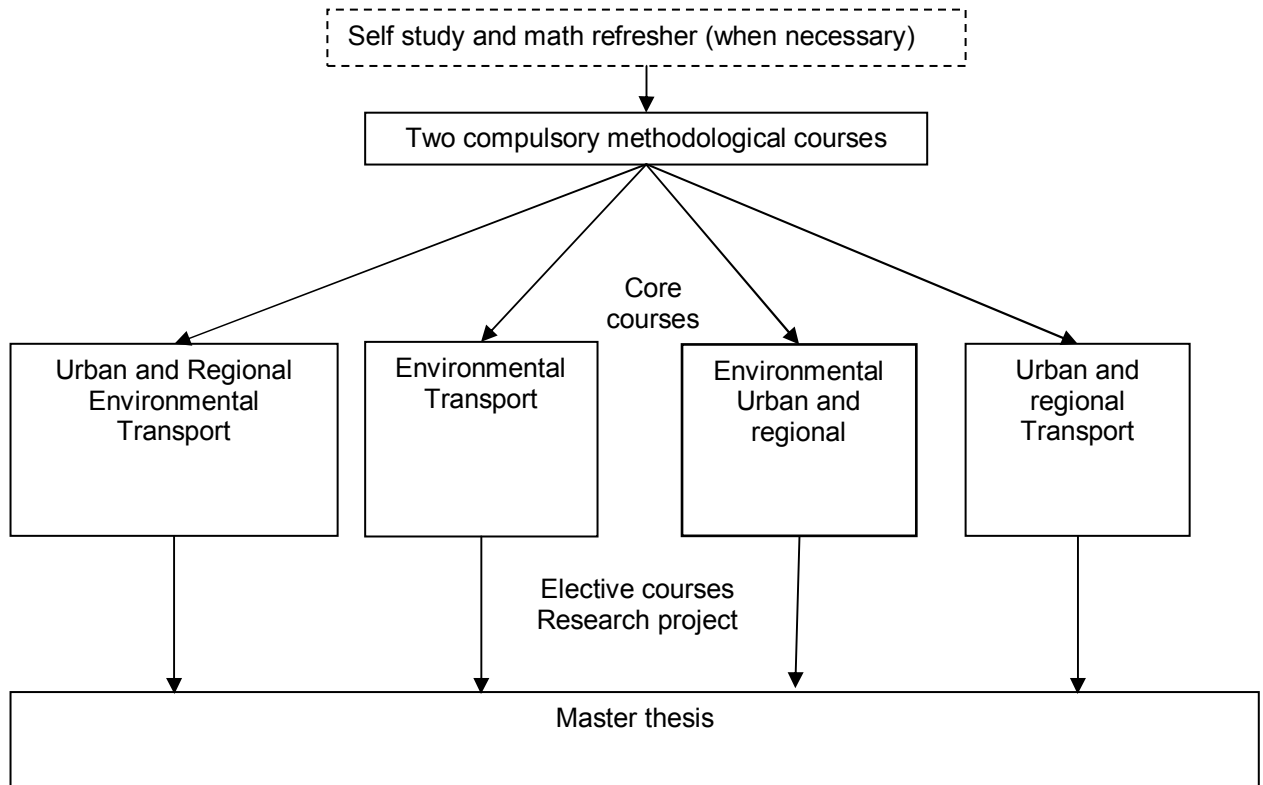
5   Annexes

Annex 1:   Final qualifications of the study programme

After completion of the study programme students should be able to carry out independent research in spatial economics and be able to analyse complex problems concerning at least two of the three interrelated disciplines, take into account multidisciplinary aspects when relevant and suggest appropriate policy measures if necessary.

After completing the study programme the student has:
1. an academic level of thinking (logical, reflective, critical, creative, ethical and independent);
2. theoretical, methodological and empirical knowledge of the relevant aspects of spatial economics, especially about policy aspects connected to location decisions, urban and regional development, the functioning of the land market and spatial planning policy; the functioning of markets and the associated failures in traffic and transport and the policy implications; and the economics of environmental problems and policy;
3. knowledge of and insight into the various relationships between economics, space, transport, environment and policy;
4. skills to independently set up, prepare, carry out and report on scientific research; ability to adequately analyse, interpret and critically examine his/her own research results and those of others and to clearly present the results of such analyses verbally as well as on paper;
5. insight into the importance of the field of spatial economics in its broad historical, philosophical and social context;
6. methodological knowledge required to independently carry out policy-related or other research in the domain of the programme;
7. professional skills required to apply this knowledge adequately, efficiently and productively in actual practice. Moreover, he/she has the ability to creatively and systematically handle problems occurring in professional practice, by using the relevant theoretical and methodological knowledge and skills to clarify and solve them;
8. insight into the policy aspects and challenges present in the domain of the programme, and knowledge and skills to adequately reflect on them and give appropriate advice from an economic perspective;
9. 9. academic attitude, independence, communicative abilities (verbally and on paper), a collaborative attitude and a critical awareness of the moral and ethical dimensions of scientific knowledge and its application;
10. academic skills in accessing new literature, judging its relevance, absorbing and applying it in his/her daily professional practice.

Annex 2:   Survey study programme

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   Self study and math refresher (when necessary)
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        ┌──────────────────────────────────────┐
        │  Two compulsory methodological courses │
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Core courses

Urban and Regional Environmental Transport	Environmental Transport	Environmental Urban and regional	Urban and regional Transport

Elective courses
Research project

Master thesis

There are three core courses: a) Regional and Urban Economics, b) Environmental Economics and c) Transport Economics. Students have to choose at least two core courses and at least two elective courses (f.e. Applied Spatial Economics, Geographical Information Systems, Real Estate Management, Applied Transport Economics, Airline Business, Network Analysis, International Environmental Economics. Students have the option to take part in all three core courses or choose more electives. Choice of an elective outside the department is possible, but it does require the permission of the Examination Board.

The basic setting of the programme:

Period (weeks)	Courses (EC)	
Period 0	Self-study (when necessary, f.e. mathematics)	
Period 1 (8)	Advanced Methods for Applied Spatial Economic research (6) Microeconomics for Spatial Policy (6)	Tutorials supporting self-study (when necessary)
Period 2 (8)	Core or Specialization course (6) Core or Specialization course (6)	
Period 3 (4)	Research project (literature review – preparation of MSc thesis (6)	
Period 4 (8)	Core or Specialization course (6) Core or Specialization course (6)	
Period 5 and 6 (12)	MSc Thesis (18) and option for Specialization course (6, optional)	

Total 60 EC

Annex 3:   Expertise members auditpanel and secretary

Specific additions concerning panel members and secretary:

Mr. Professor R.W. Vickerman, chairperson
Professor Vickerman is primarily deployed due to his expertise of the domain of European Economics/ Regional & Transport Economics. He is Professor of European Economics and Dean of the University of Kent at Brussels. He studied at the Universities of Cambridge and Sussex and after a period as a Research Fellow at Sussex and as Lecturer at Hull moved to the University of Kent in 1977, becoming Professor of Regional and Transport Economics in 1989 and Professor of European Economics in 1998. He was Head of School from 1993-1999 and again from 2005-2009. He founded the Centre for European, Regional and Transport Economics in 1993 and has been its Director since then.
He has held visiting posts at the Universities of Münster (Germany) and Guelph (Canada) and was Visiting Professor at the Institute of Transport Studies, University of Sydney (Australia) in 1999 and the Central European University in Budapest 2001-2005. He has worked as a consultant to the European Commission, the UK Government and Kent County Council. He was a member of the Planning Advisory Group of the School of the Environment (1994-96), of the Standing Advisory Committee on Trunk Road Assessment, School of the Environment, Transport and the Regions (1996-1999), and Economic Advisory Group of the Home Office 2006-2008.
He was a member of the Wissenschaftlicher Beirat (Scientific Advisory Council) of the Deutsches Institut für Wirtschaftsforschung (DIW), Berlin from 1998 to 2005, and has been a member of the Conseil Scientifique of the Groupement Régional Nord Pas de Calais pour la Recherche dans les Transports (GRRT), Lille since 1991. He currently serves on the Editorial Boards of *Regional Studies, Transport Policy* and *Letters in Spatial and Resource Science.*
In 2001 he was elected to the Academy of Learned Societies for the Social Sciences of which he was elected to the Council in 2007. In 2002 he was awarded the honorary degree of Dr. rer.pol by the Philipps Universität Marburg, Germany.
He has knowledge of the accreditation system based on previous audit visits, has wide (international) knowledge of (higher) education and educational processes based on his qualifications and work experience.

Education
1968-1972   University of Sussex, Dphil Economics
1965-1968   University of Cambridge, MA Economics

Work Experience:
1972-1977   University of Hull, Lecturer in Economics
Since 1977   University of Kent:

1977 – 1979		Lecturer
1979 – 1987		Senior Lecturer
1987 – 1989		Reader
since 1989		Full Professor
1993 – 1999, 2005 – 2009		Head of School of Economics
since 2009		Dean of Brussels Campus

Other:

Council Member Academy of Social Sciences (UK);

Experienced Quality Assurance Reviewer for QAA (UK) and regular external reviewer for programmes in UK universities;

Experience of research programme reviews in Belgium, Netherlands, France, Sweden;

PhD external examiner/jury member in UK, France, Belgium, Germany;

Editor in Chief: Transport Policy,

Editorial Board Member: Regional Studies;

Letters in Spatial and Resource Sciences

Publications 2006 – 2011:

- *Handbook of Transport Economics*, Edward Elgar, Cheltenham, 2011, forthcoming (ed. with André de Palma, Robin Lindsey and Emile Quinet)
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Mr. Prof. Dr. G. Allaert
Professor Allaert is primarily deployed due to his expertise of the domain of Spatial planning and regional development. Mr. Allaert is the head of the Research Centre for Mobility and Spatial Planning and the chairman of the Institute of sustainable mobility, both situated at the Faculty of Engineering, Ghent University, Belgium. He is since 1990 full-time professor and senior professor in spatial economy and spatial planning. He teaches in spatial economy (urban and regional), urban and regional management, port economy and port planning, regional planning including planning theory at the Ghent University, but also at the interuniversity level (with the Catholic University of Leuven and the University of Antwerp). As senior fellow of the Johns Hopkins University (Baltimore, USA) he has stayed there for research in metropolitan planning and research at this university. His research focuses on several spatial topics (ports, port-cities, city-regions, spatial networks, spatial logistics, regions) at diverse spatial levels (local, regional, European). He is lead partner and partner of several European projects (EC-projects) and has been promotor of federal projects (Belgium), regional projects (Flanders). He reviews for international scientific bodies and organisations: Ph.D.-review, peer review of articles in A1-journals, review of research projects and review of existing educational programs (NVAO – Nederlands Vlaamse Accreditatie Organisatie). He is member of the Regional Science Association and has been asked on several international congresses as (opening)-speaker.

He is also member of the board of editors of RIUS (Research in Urbanism Series, technical University Delft). More than 300 scientific publications over his whole career is the output of the full-time academic career. Under his promotorship six researchers (in spatial planning or spatial economy) obtained a Ph.D. and four doctoral dissertations are in progress. Mr. Allaert has knowledge of the accreditation system based on previous audit visits, has wide (international) knowledge of (higher) education and educational processes based on his qualifications and work experience.

Education:

1978 – 1979	Ph.D. in Urban Development, Physical Planning and Development, Ghent University
1972 – 1973	Aggregate Higher Education, Ghent University
1971 – 1972	M.D. in Urban Development, Physical Planning and Development, Ghent University
1970 – 1971	M.D. in Applied Sciences, Department of Geography, Ghent University

Work experience

1996 - present	Senior Professor Spatial planning and regional development, Ghent University
1990 -1996	Professor Spatial planning and regional development, Ghent University
1970 -1990	Full-time scientific researcher, Ghent University

<u>*Mr. Prof. Dr. A. Tukker*</u>

Professor Tukker is primarily deployed due to his expertise of the domain of sustainable innovation as Program Manager Sustainable Innovation at TNO Built Environment and Geosciences; Business Unit Innovation and Environment, Delft, The Netherlands. At the same time since April 2010 he is professor of Sustainable Innovation at Norwegian University of Science and Technology (NTNU) in Trondheim, Norway. Mr Tukker has assignments on four scientific editorial boards. In this context, he reviews on a regular basis books, book proposals and (draft) scientific articles for about 10 scientific journals (on average 10/year). He currently investigates with a major publisher the launch of a dedicated Journal on Sustainable Consumption. He has knowledge of the accreditation system based on previous audit visits, has wide (international) knowledge of (higher) education and educational processes based on his qualifications and work experience.

Education:

2007 – 2009	Development Inspiring Leadership, BonSpirit, Breda: Dedicated TNO leadership Various other courses in the field of journalism, computer science, etc.
1999	De Vlerick Leuven-Gent Management School: Dedicated TNO Research management
1996 – 1998	Tilburg University, Ph.D. Thesis 'Frames in the toxicity controversy – Risk assessment and Policy Analysis related to the Dutch Chlorine Debate and Swedish PVC Debate
1987	Colegio Estudios Hispanicos, Salamanca, Spain: Spanish.
1979 – 1987	University of Utrecht, Utrecht, the Netherlands - M.Sc. in Chemistry, MO-B (high grade) teachers license

Work experience

2010	Professor of Sustainable Innovation (part time, 20%) - Norwegian University of Science and Technology (NTNU), Industrial Ecology Program, Trondheim, Norway
2005 – present	Manager of the Transitions and System Innovation Research Program and leader of the Market (after April 2010: 80%) - TNO Built Environment and Geosciences, Business Unit Innovation and Environment, Delft
1994-2005	Manager of the Sustainable Innovation Program - TNO Strategy, Technology and Policy (TNO-STB), Sustainable Innovation Team, Delft

1990-1993	Senior consultant / deputy section manager - Study Centre for Environmental Research of TNO (SCMO), section Chain-policy, Delft
1988-1990	Waste management policy and enforcement specialist - Inspectorate for the Environment, Ministry of Housing, Physical Planning and Environment, the Hague
1981-1987	Inspector Food Legislation (part-time) - CIVO-TNO, Zeist

Publication lists:
- 5 books and over 15 book chapters
- about 40 peer-reviewed scientific papers
- about 70 lectures on invitation, of which 10+ on major international conferences with over 200 participants
- about 20 other papers, 40 other presentations and 100 technical research reports.

Involved in a variety of evaluation boards, panels and commissions:
- Member of the Dutch Commission for Environmental Impact Assessment (appointed by Royal decree of May 2001)
- Scientific Boards of a great variety of conferences, including meetings of the International Society of Industrial Ecology (2005, 2007, 2009), the European Roundtable on Sustainable Consumption and Production (2004, 2005, 2009, 2010), and the Sustainable Innovation conference series organized by CfSD (2002-2006)
- Member of review- and advisory boards of about 20 other programs and projects (a.o. for the EU's Framework programs, LIFE, Irish EPA, ADEME (France), IIASA (Austria), the Dutch EIA commission, and others)
- Member of the core team of the Knowledge network on System Innovation (KSI), a research program funded with 10 Mio Euro via the Dutch BSIK Program (2005->).
- Member of an Expert Panel on Integrated Product Policy (12 persons), installed by the EU DG Environment for the period 2006-2007
- Member of two EUROSTAT Expert panels on Environmental Indicators and Sustainable Resource Use
- Advisor to various universities on proposed appointments at professor/reader level
- Roles as (co-)supervisor and/or opponent of 2 Ph.D. students (Rotterdam University, Lund University)

Ms. K.M.C. Lageweg

Ms. Lageweg is deployed as a student panel member. She studies the Master study programme Environmental Sciences at Wageningen University. With regard to age and preparatory training, Ms Lageweg represents the primary target group of the study programme. She possesses student-related insight into study load, educational methods, facilities and quality control. Ms. Lageweg is familiar with audit visits and she has been given additional individual briefing about audit visit procedures and NQA's method of working.

Education:
2003-2007	Bachelor Environmental Sciences – RU (Radboud University) (completed)
2007-2008	Master Environmental Sciences – RU (Radboud University) (not completed)
2009-present	Master Environmental Sciences Wageningen University (not yet completed)

Various:

2006-2009	Secretary student union AKKU and coordinator UMP (Universitair Milieu Platform)
2007-2008	Member education committee Environmetal Sciences
2007-present	Active member AKKU (a.o. application board, advisory board, trainer)
2007-present	Active member Morgen (previously LHUMP), a student network for a sustainable future (a.o. application board, advisory board)
2008	Internship DHO – substantive support in the AISHE-project. (AISHE is a tool to measure the sustainability of a Higher Education Institute)
2009-present	Active member student union LSVb (a.o. application board and personal coach of a board member)

NQA Panel member Mrs. Ir. M. Dekker - Joziasse

Mrs Dekker is deployed as NQA auditor. She has over 15 years of experience with audit visits in almost all sectors of Higher Level Professional Education. She has auditor qualities due to many years of assessment experience and courses attended Lloyd's Register. Based on this experience she also has expertise in assessment of correspondence courses.

She was an NQA teacher for the auditor training higher education herself and she has knowledge of higher education, among others through teaching experience at Wageningen University and through educational courses. Mrs Dekker was certified by the NVAO to act as secretary to the accreditation panels.

Education:

1977 – 1983	Secondary school " VWO", Christelijke Scholengemeenschap Walcheren, Middelburg, The Netherlands
1983 – 1989	MSc Horticultural Science, Wageningen University, The Netherlands

Work experience:

1990 – 1991	Advisor at Agricultural Consultancy
1991 – 1995	Added teacher Wageningen University, department horticulture plant cultivation, charged with educational development
1995 – 2004	Policy employee Quality department, Council for Higher Professional Education, 7 review routes in several fields or sectors of higher professional education
2004 – to date	Auditor/accountmanager NQA.

Courses:

Training Auditor Higher Education, October 2003, NQA in association with Lloyd's Register
Two day course Internal Quality Reviews, December 2002, Lloyd's Register

Annex 4:   Program for the site visit

Day 1, Monday 10 October 2011:

Time	Item	Participants
13.30 – 14.00 hrs.	Welcome and tour	Panel Programme management: Prof. Dr. Piet Rietveld, Head of Department Dr. Jan Rouwendal, Programme manager Prof. Dr. Henri de Groot, management team
14.00 – 15.00 hrs.	Preparation for critical reflection	Panel
15.00 – 17.30 hrs.	Inspection of material: - Study material - Student material: theses selected by NQA - Student material: products by students to be interviewed by the panel on day 2 Open consultation	Panel
17.00 – 17.30 hrs.	(± ½ hour, time mutually agreed upon)	No appearance for the open consultation
17.30 – 18.30 hrs.	Preparation with regard to student material	Panel

Day 2, Tuesday 11 October 2011:

Time	Item	Participants
08.30 – 09.15 hrs.	Block Contents I: alumni/graduation	Marjolein van der Schaaf MSc, alumnus 2011 Ellen Schep MSc, alumnus 2011 Susanne Balm MSc, alumnus 2010 Gijs Brussen MSc, alumnus 2011
09.30 – 10.15 hrs.	Block Contents II: graduation	Prof. dr. Henri de Groot, thesis supervisor Marjolein v/d Schaaf dr. Thomas de Graaff, thesis supervisor Ellen Schep dr. Peter Mulder, thesis supervisor Susanne Balm Prof. dr. Cees Withagen, thesis supervisor Gijs Brussen
10.15 – 11.00 hrs.	Block Content III: students	Daniel Pinchasik, 1st year Mrs. Laura Turcanu, 1st year Tim Winke, 1st year Elco Koks, 2nd year Mrs. Lisette Vernooij, 2nd year
11.15-12.00 hrs.	Lecturers	Prof. dr. Erik Verhoef, courses: Microeconomics; Transport Economics Prof. dr. Daan van Soest, Courses: Environmental Economics dr. Jasper Dekkers, Courses: Geographical Information Systems dr. Jos van Ommeren, Courses: Applied Transport Economics dr. Mark Lijesen, Courses: Airline Business; coordinator Research Project and thesis class

12.00 – 13.15 hrs.	Lunch break + consultation / extra inspection of material	Panel
13.15 – 14.00 hrs.	1st talks with study programme management	Prof. dr. Piet Rietveld, Head of Department dr. Jan Rouwendal, Programme manager Prof. dr. Henri de Groot, Member management team
14.15 – 15.00 hrs.	Assurance	dr. Jan Rouwendal, Member Programme committee 2010/2011 Ana Palaiologk, Student member Programme committee 2010/2011 Yuval Engel MSc, student member programme committee 2009/2010 (now PhD at the department Management& Organisation) Prof. dr. Hester van Herk, Member Examination board drs. Sabine van Vugt, Secretary Examination board
15.00 – 15.45 hrs.	Possible extra talks	-
15.45 – 16.45 hrs.	Assessment meeting	Panel
16.45 – 17.30 hrs.	2nd talks study programme management including rounding-off	Prof. dr. Piet Rietveld, Head of Department dr. Jan Rouwendal, Programme manager Prof. dr. Henri de Groot, Management team Open to others interested in the preliminary outcomes of the audit

Annex 5:   Documents examined

Documents examined during site visit:

1. Study Guide 2011/2012
2. Digital course evaluations
3. For each course:
    (i) the course material
    (ii) exam and resit (2010-2011), including standard answers and corrected exams
    (iii) assignments where relevant
    (iv) all literature (books and readers)
4. Composition Examination Board, Programme Committee and Programme management
5. Minutes of OLC meetings
6. Education & Examination rules and regulations
7. Manual 'FEWEB Onderwijsdag, 25 maart 2010, Thema: Toetsing' (in Dutch)
8. Yellow card with examination guidelines
9. Handbook Quality Assurance VU (March 2011) – a.o. inomration on study advice
10. Eleven thesis (as selected by peer review committee)
11. Results National Student Evaluation 2011 (NSE) (in Dutch)
12. Data on incoming students 2011/2012
13. Inventory support professional field, 2007 (in Dutch)
14. Minutes Advisory Board (in Dutch).

Annex 6:   Summary theses

Below a summary of the students whose theses have been examined by the panel.
According to NVAO's rules only studentnumbers are included.

Studentnumber	Grade	Date diploma
1559249	7	august 2011
2118696	7.5	August 2011
1941852	7.5	August 2011
1633422	8.5	July 2011
1957406	7	July 2011
2116863	9	July 2011
1679031	8.5	April 2011
1657852	6.5	March 2011
1635905	8	October 2010
1553623	8	August 2010
1999176	6.5	August 2010
1834169	6	June 2010
1770403	8	September 2009
1737244	8	August 2009
1405497	6	February 2009
1737333	7	September 2008

Annex 7: **Declaration of Comprehensiveness and Accuracy**

Declaration of Comprehensiveness and Accuracy

Regarding the peer review visit of the programme:
MSc Spatial Transport and Environmental Economics

Institution:
VU University Amsterdam, Faculty of Economics and Business Administration

Date of peer Review Visit:
10 and 11 October 2011

I, the undersigned:
dr. Jan Rouwendal

Representing the management of the above mentioned MSc Programme, in the position of:
Programme Manager

hereby declare that the information presented for the purpose of the peer review of the mentioned programme is comprehensive and accurate, to assure the peer review committee can form a judgement based on true facts.

Signature:

Date: *29 August 2011*

vrije Universiteit *amsterdam*

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