Assessment report
Limited Framework Initial Accreditation

MSc Transport and Supply Chain Management

Vrije Universiteit Amsterdam

Contents of the report

1. Executive summary

In this executive summary, the panel presents the main considerations which led to the assessment of the quality of the MSc Transport and Supply Chain Management of the Vrije Universiteit Amsterdam. The programme was assessed according to the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, as published on 20 December 2016 (Staatscourant nr. 69458).

The programme in Transport and Supply Chain Management aims to provide students with strong analytical capabilities and knowledge in the domains of supply chain management and transport economics. Graduates of the programme are able to apply these to nowadays challenges in the areas of logistics and supply chain. Students are therefore equipped with a set of quantitative methods and techniques as well a relevant skill set, such as the use of programming software and collaborative and communicative skills. The programme resides in a rich academic environment of high standing and has ample connections to the professional field. The panel has established that the programme found a unique niche in combining the areas of supply chain management and transport economics, but recommends that the programme to stronger express its unique character in the intended learning outcomes. The panel concludes that the learning outcomes display the academic character of the programme and are formulated at master's level. The panel concludes that the programme meets standard 1, intended learning outcomes.

The programme admits students with various disciplinary backgrounds and is open to international students. The panel is positive about the attention of the programme for the admission of students, for example demonstrated by the fact that all potential students have an interview prior to admission. This interview is focused at establishing a match between the programme and the candidate. The panel observes that the curriculum consists of mandatory courses and allows students to specialise themselves by taking various electives. The intended learning outcomes are translated into course objectives for each course. The panel noted that the integration between the areas of supply chain management and transport economics takes place but could be strengthened and made more visible in the programme's structure. In addition, the panel recommends the programme to include a design approach in the methodological approaches taught to students. The panel observes that the programme provides a rich learning environment. Students are exposed to the professional field and staff members of the programme are experts in their field. About 40% of the staff members have an international background. Staff members are enthusiastic and competent teachers. The panel concludes that the programme meets standard 2, teaching and learning environment.

The assessment methods used by the programme are varied. The programme's management as well as the Examination Board have measures in place to stimulate a reliable and valid assessment practice. The panel is positive about the programme's systematic approach in this regard. The panel recommends the Examination Board to start reviewing samples of theses in order to see to it that the process of assessment results in valid and reliable testing. The panel concludes that students are informed on the assessment criteria. The panel concludes that the programme meets standard 3, student assessment.

The theses reviewed by the panel demonstrate mastery of the intended learning outcomes by the students. Students choose relevant topics and apply theoretical insights to practical problems. Not all theses demonstrate the integration of the supply chain management area with the area of transport economics. All thesis do include an ethical reflection on the solutions provided. That there is a need for graduates of

the programme becomes very clear from the success of alumni on the job market. The panel concludes that the programme meets standard 4, achieved learning outcomes.

The panel assesses that the programme is focused at the broad domain of Economics, and therefore advises that the programme will be allocated to the CROHO-sector 'Economics'.

The panel that conducted the assessment of the MSc programme in Transport and Supply Chain Management of the Vrije Universiteit Amsterdam assesses this programme to meet all the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, judging the programme to be satisfactory. Therefore, the panel recommends NVAO to accredit this programme.

Rotterdam, 11 April 2019

Dr. Cees Terlouw
(panel chair)

Jetse Siebenga MSc.
(panel secretary)

2. Assessment process

The evaluation agency Certiked VBI received the request by Vrije Universiteit Amsterdam to support the initial programme assessment process for the MSc Transport and Supply Chain Management. The objective of the programme assessment process was to assess whether the programme would conform to the standards of the limited framework, as laid down in the NVAO Assessment framework for the higher education accreditation system of the Netherlands, published on 20 December 2016 (Staatscourant nr. 69458). The programme is an existing programme which is organised as a specialisation of the MSc. Programme in Business Administration. The Vrije Universiteit Amsterdam requests for an independent accreditation of the programme.

The management of the programmes in the assessment cluster Business Administration convened to discuss the composition of the assessment panel and to draft the list of candidates.

Having conferred with management of the programme, Certiked invited candidate panel members to sit on the assessment panel. The panel members agreed to do so. The panel composition was as follows:

- Dr. Cees Terlouw (chair); Emeritus lector Intake and Transition Management Higher Education Saxion University of Applied Sciences
- Prof. dr. Peter van Baalen, Full Professor in Information Management and Digital Organisation, University of Amsterdam;
- Prof. dr. Marc De Ceuster, Full Professor in Finance, Antwerp University;
- Prof. dr. ir. Rob van der Heijden, Full professor in Innovative Planning Methods, Nijmegen University.
- Marijke Speelberg MSc. (student-member), recently graduated student Master Global Business and Master Sustainability, Erasmus University Rotterdam (student-member).

On behalf of Certiked, J.W. Siebenga MSc. served as the secretary in the assessment process. The overall coordination of the assessment cluster Business Management was executed by drs. W. Vercouteren. Drs. Laura Oosterveld, policy advisor at NVAO, was present during the site visit as an observer.

All panel members and the secretary confirmed in writing being impartial with regard to the programme to be assessed and observing the rules of confidentiality. Having obtained the authorisation by the University, Certiked requested the approval of NVAO of the proposed panel to conduct the assessment. NVAO have given their approval.

To prepare the assessment process, the process coordinator convened with management of the programme to discuss the outline of the self-assessment report, the subjects to be addressed in this report and the site visit schedule. In addition, the planning of the activities in preparation of the site visit were discussed. In the course of the process preparing for the site visit, programme management and the Certiked process coordinator regularly had contact to fine-tune the process. The activities prior to the site visit have been performed as planned. Programme management approved of the site visit schedule.

Well in advance of the site visit date, programme management sent the list of final projects of graduates of the programme of the last two complete years. Acting on behalf of the assessment panel, the process coordinator selected 8 final projects from this list. The grade distribution in the selection was ensured to conform to the grade distribution in the list, sent by programme management.

The panel chair and the panel members were sent the self-assessment report of the programme, including appendices. In the self-assessment report, the student chapter was included. In addition, the expert panel members were forwarded a number of final projects of the programme graduates, these final projects being part of the selection made by the process coordinator.

A number of weeks before the site visit date, the assessment panel chair and the process coordinator met to discuss the self-assessment report provided by programme management, the procedures regarding the assessment process and the site visit schedule. In this meeting, the profile of panel chairs of NVAO was discussed as well. The panel chair was informed about the competencies, listed in the profile. Documents pertaining to a number of these competencies were presented to the panel chair. The meeting between the panel chair and the process coordinator served as the briefing for panel chairs, as meant in the NVAO profile of panel chairs.

Prior to the date of the site visit, all panel members sent in their preliminary findings, based on the self-assessment report and the final projects studied, and a number of questions to be put to the programme representatives on the day of the site visit. The panel secretary summarised this information, compiling a list of questions, which served as a starting point for the discussions with the programme representatives during the site visit.

Shortly before the site visit date, the complete panel met to go over the preliminary findings concerning the quality of the programme. During this preliminary meeting, the preliminary findings of the panel members, including those about the final projects were discussed. The procedures to be adopted during the site visit, including the questions to be put to the programme representatives on the basis of the list compiled, were discussed as well.

On 9 January 2019, the panel conducted the site visit on the University Campus of the Vrije Universiteit Amsterdam. The site visit schedule was in accordance with the schedule as planned. In a number of separate sessions, the panel was given the opportunity to meet with Faculty Board representatives, programme management, Examination Board representatives, lecturers and final projects examiners, and students and alumni.

In a closed session at the end of the site visit, the panel considered every one of the findings, weighed the considerations and arrived at conclusions with regard to the quality of the programme. At the end of the site visit, the panel chair presented a broad outline of the considerations and conclusions to programme representatives.

The draft report was finalised by the secretary, having taken into account the findings and considerations of the panel. The draft report was sent to the panel members, who studied it and made a number of changes. Thereupon, the secretary edited the final report. This report was presented to programme management to be corrected for factual inaccuracies. Programme management were given two weeks to respond. Having been corrected for these factual inaccuracies, the Certiked bureau sent the report to the University Board to accompany their request for initial accreditation of this programme.

3. Programme administrative information

Name programme in CROHO: M Transport and Supply Chain Management

Orientation, level programme:	Academic Master
Grade:	MSc
Number of credits:	60 EC
Specialisations:	
Location:	Amsterdam
Mode of study:	Full-time (language of instruction: English)
Registration in CROHO:	n.a.
Name of institution:	Vrije Universiteit Amsterdam
Status of institution:	State-funded University
Institution's quality assurance:	Approved

4. Findings, considerations and assessments per standard

4.1 Standard 1: Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Finding
The overall aim of the programme is to teach students to be able to analyse and redesign supply chains and transport networks. This includes for example the management of transport and stock in global networks, and defining strategies for managing these networks. The programme also focuses on the policy aspects of managing supply chains and transport networks, including the impact of government regulation on transport networks or the effect of transport policy on transport and logistics companies and the markets and environments in which these companies operate.

From discussions with industry, a clear need for graduates with applied quantitative skills has become apparent. This has resulted in the aim of the programme to deliver graduates with an academic approach and relevant skills, as well as awareness of the professional field to which graduates apply these. The programme made a comparison with other programmes in the domains of transport and supply chain management. From this comparison it becomes clear that the combination of supply chain management and transport economics is not offered, except in the programme Transport, Infrastructure and Logistics of Delft University of Technology. The focus of this programme is stronger on transport policy than on supply chain management. Most international programmes also don't offer the combination of transport economics and supply chain management. Another unique feature of the programme in comparison to most international programmes is the strong emphasis of the programme on quantitative skills. The extent to which the programme aims to combine an academic approach with a focus on application of relevant skills is also quite unique.

The programme drafted six intended learning outcomes, in accordance with the format in use by the School of Business and Economics. The learning outcomes as such address attitudes, skills and knowledge. Three roles are distinguished: the academic role, the professional role and the citizen role. Regarding the academic role, the programme aims to teach students academic skills, theoretical knowledge and critical reasoning. Regarding the professional role, the programme aims to provide students with skills, such as presentation skills and collaboration skills. Regarding the role of citizen, students are expected to reflect on ethical aspects.

The learning outcomes are related to the Dublin Descriptors. Students are expected to develop academic, research and communicative skills at an advanced level and be able to apply these to the professional sphere. The intended learning outcomes address the ability of evaluating and assessing state-of-the-art theories and methods to develop strategies for practically relevant decision making in the area of transport economics and supply chain management. In addition, students are able to assess industry and societal dynamics, challenges and opportunities (academic role). Students have the professional skills to effectively interact with internal and external stakeholders in managing transport and supply chain related problems (professional role) and are exposed to supply chain issues in broader societal contexts (citizen role).

Considerations

The panel concludes that the programme's intended learning outcomes are in line with the international standards. The programme's profile is unique for the Netherlands by combining the domains of supply chain management and transport economics and approaches aimed at integrating these two. The panel recommends the programme to define more specifically the integral vision on these two areas. From an international perspective, the programme stands out by adopting a strong quantitative approach. This allows the programme to offer expertise to graduates which is attractive to the international professional field. The programme's connections to the professional field are strong. In addition, the programme is nourished by a strong research group which is of a high international standing.

Assessment of this standard
These considerations have led the assessment panel to conclude the programme to meet standard 1, Intended learning outcomes.

4.2 Standard 2: Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings
The programme adopts a holistic approach towards admission. This means that besides the necessity to possess knowledge in the domain, the programme also takes into account student's motivation and CV. The programme admits students with various backgrounds, such as business administration, economics or engineering. The admission criteria are presented in the self-evaluation report.

All potential students are, prior to admission, invited for an individual meeting via telephone, skype or similar. The purpose of this 15-minute conversation is to discuss interests, capabilities as well as programme requirements. The discussion is focused at making a match between student's interest and the programme. Students are advised to prepare well for the highly quantitative approach of the programme, and are suggested readings for self-study before the start of the programme.

Admitted to the programme are students who graduated from one of the bachelor programmes offered by the School of Business and Economics, provided that these students have followed predefined specialization courses. Students with a bachelor diploma in Business Administration from other universities are eligible, provided that their course work is similar to the SBE programme. A third of the students have an international background.

The programme consists of six periods and is structured in three learning lines, the methodological learning line, the supply chain learning line and the transport networks learning line. All intended learning outcomes are translated in course objectives and the programme provided an overview of the connection between the courses and the learning outcomes.

The programme starts with two mandatory courses, titled Supply Chain Management and Transport Economics Management. During these courses, students are introduced to the methods and tools used within these domains. In the second block students take a course titled Decision Making in Supply Chain (mandatory). During this course, students develop advanced ability to work with Microsoft Excel. Other software programmes in which student's skills are developed are VBA (Visual Basics for Application) and *R* and students also learn how to use GIS (Geographical Information Systems). Student take one elective course in the second block and take two elective courses in the third block. Electives on offer are Network Analysis, Supply Chain Execution, Geographical Information Systems, Airline Business, Supply Chain Lab and Operations Performance Benchmarking. In addition, students can opt to do an internship. The panel discussed the choice of the programme for an elective in Airline Business, since students should learn general principles on supply chain and transport networks, which can be applied to other modes of transport as well. The focus on the airline industry stems from the nearness of Airport Schiphol resulting in a demand for graduates with some insights in the Airline Business. The course is strongly related to the lecturer's research as well and students get acquainted with doing research in this industry.

The integration of the fields of supply chain management and transport economics is mainly taught through the introduction of conceptual notions that are similar to both areas. In the methodological courses students learn to use methodologies which are relevant to both areas and allow the integration thereof. The students are not introduced to a design perspective, which seems relevant for the future development of transport networks and supply chains. The programme adopts a more classical analytical

approach. The methodological courses introduce students to research methods such as case studies, surveys, experiments, choice analysis and quantitative analytical models. Students are not obliged to integrate the areas of supply chain management and transport economics in their thesis.

Before the Christmas holidays students have to think about their topic of interest for their thesis and are matched with a thesis supervisor. In the fourth block students take the course Applied Research Methods (mandatory) and an elective. The number of courses scheduled in the fifth and sixth block is low so students can work on their 15 EC thesis (mandatory) and/or start their internship (elective). Students can write their thesis in cooperation with a company if this company is able to provide students with a relevant data set.

The programme drafted a table which shows that students obtain the learning outcomes in the core elements of the programme, and in addition, develop competencies on the first three learning outcomes of the programme in the elective courses. In the elective Supply Chain Lab, students also develop the other learning outcomes. In this lab, a mixture of lectures, tutorials, assignments and case studies offer students the support to master sufficient skills to tackle real-life cases in distribution logistics. The programme's didactical approach is strongly reflected by this course, and is amongst others focused on skill building and on quantitative data analysis. Other elements of the didactic approach are for example the connection to the professional practice, and the interaction with peers in a culturally diverse environment. Of the 80 students that were enrolled in the predecessor of the programme (the Transport and Supply Chain Management specialisation of the MSc Business Administration), about one third of the students had an international background.

The programme provides students with various opportunities to enrich their learning experience, for example with community service learning in which students voluntarily help societal organisations with solving a logistic or supply-chain related problem. Another example is the competition with peers in working on real-life problems, offered by a company. Winning teams get the opportunity to present their solution to the management team of the company providing the challenge. The panel observes that throughout the programme students are confronted with the professional practice through guest lecturers, company visits, stylized case studies and real-life practical problems. In addition, students are made familiar with developments in research throughout the programme: in various courses, lecturers involve students in their own research. In addition to the course work, students follow a colloquia series in which a number of invited speakers discuss a variety of topics including ethics, sustainability, data integrity, and implementation issues. Students write a report which is enclosed as an appendix to the thesis.

The programme is jointly lectured by staff members from the Logistics research group and Spatial Economics research group. The research groups are both strongly internationally oriented and publish at the highest level. In addition, 45% of the course coordinators of the programme have an international background. All staff members have obtained their PhD and three-quarter of the staff members have obtained their University Teaching Qualification (UTQ)

Considerations
The panel concludes that the programme takes careful attention of admission requests and provides clear information to manage the expectations of admitted students. The learning objectives are translated into the course objectives and content, and the panel concludes that the programme allows students to obtain all the learning outcomes. The structure of the programme displays a coherent set of compulsory courses with related elective courses. The structure of the programme allows students with various backgrounds to level their knowledge and experiences and adjust to the expectations of the programme. The panel sees

room for improvement in the integration of the two areas of supply chain management and transport economics. The integration should be more clearly elaborated and stronger emphasized in the curriculum. Although students should have room to specialise, the avoidance of one of the areas by student's selection of courses should be prevented. The panel further suggests that the integration of the two areas could be strengthened by making the core concepts of 'decision making' and 'networks' more visible in the programme's structure. In addition, the panel recommends that the programme also includes a design approach in the methodological approaches taught to students. Since these concepts and the design approach appear to be of high importance to both areas, they could function as the mechanism for the integration of these areas within the curriculum.

The teaching and learning methods relate well to the course objectives and offer a varied learning environment. This includes the learning of programming skills, the community service project and also the colloquia. The panel is very positive about the extent to which students develop an academic orientation towards the professional practice. The visibility of the professional field within the programme is high, through which students get a clear outlook on real-life problems. The panel recommends that the programme keeps up with the dynamics of technology in supply chain, and includes a pro-active approach towards changes driven by digitalization. The addition of design methodology to the methodologies taught by the programme will allow graduates of the programme to shape these changes.

Staff members of the programme are experts in their field and competent, enthusiastic teachers.

Assessment of this standard
These considerations have led the assessment panel to conclude the programme to meet standard 2, teaching-learning environment.

4.3 Standard 3: Student assessment

The programme has an adequate system of student assessment in place.

Findings
The assessment policies are described in the University's manual on quality assurance. The examination policies, are drafted on the basis of this manual. The programme provided an assessment plan which indicate the connection between the intended learning outcomes and the assessment thereof in the various courses, specified for core elements of each course. The assessment plan further provides an overview of the assessment methods used in each course. The programme uses a variety of assessment methods, such as open exams, individual assignments and presentations. In almost all courses, more than one assessment method is used. For all courses a test blueprint is available, as well as a model answer or assessment criteria. Per course, an assessment file is assembled, containing all relevant documents regarding the assessment of the course. Assessment criteria are provided to students in course manuals and students have the right to be able to practise their skills and knowledge in at least one representative mock exam.

There are several mechanisms in place to safeguard the quality of assessment for the programme as a whole and for the individual courses. In order to structure their courses and the assessment of the courses within the programme, staff members are provided a digital tool, the 'Academic Course Support'. The quality assurance process involves an evaluation by the course coordinator and by the students. Furthermore, the construction of exams is guided by the four-eyes principle. The course coordinator has the final responsibility on the quality of assessment. With regard to the assessment of group work, the programme ensures that the individual addition of a student is valued. Students are positive about how the programme assesses group assignments.

The thesis is assessed by the supervisor and a second assessor. The thesis assessment form contains a specification of five levels of competence, for each criterion that is assessed. The staff members independently fill out this form and afterwards together decide on the grade for the thesis. In the case of strong disagreement, the thesis coordinator of the department decides on the eventual grade. The grade distribution of all thesis grades awarded in 2016-2017 and 2017-2018 in the predecessor of the programme demonstrate that theses have been awarded with an average of a 7.2. The panel agrees with the grades given to the theses it reviewed. The comments and feedback to students on the assessment form is in some cases elaborate and in other cases minimal.

The Examination Board is responsible for the process of assessment. It performs audits on the quality of the process and the outcomes thereof. These audits take a thematic approach and concern for example the validity and reliability of the multiple-choice exams. The Examination Board plans to start periodical reviews of samples of theses in order to evaluate if the process of assessing theses results in a reliable and valid assessment.

Considerations
The panel has established that the assessment methods comply with the teaching and learning methods and are fit to assess the course objectives and as such, the learning outcomes. The programme's management as well as the Examination Board have measures in place to stimulate a reliable and valid assessment practice. The panel in addition recommends the Examination Board to implement the systematic review of thesis and is positive about the involvement of external experts Last but not least,

the feedback on the assessment forms displays a wide variety in the extent to which supervisors elaborate on strengths and weaknesses of the student's achievement on the several criteria. This could be improved.

Assessment of this standard
The considerations have led the assessment panel to conclude the programme to meet standard 3, student assessment.

4.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings
The panel has reviewed eight theses. In addition, the programme provided a list of the graduates of the predecessor of the programme, including the title of the thesis of each graduate. The list and the theses reviewed by the panel show that students discuss topics related to the profile of the programme such as the optimization of forecasting parameters, planning fleet sizes, empty container management, and the use of blockchain in supply chain management. Students apply relevant theories to practical, real-life problems. All theses contain an appendix with a report on the colloquia, and include an ethical reflection.

The most recent exit poll of the predecessor of the programme, shows that 90% of the graduates had a job before even graduating. Graduates find employment in supply chain positions in a vast array of companies, such as major brand manufacturers, retailers and wholesalers. A smaller part works for consultancy firms or transport companies or with the government.

Considerations
The panel is positive about the quality of the theses reviewed. The theses reflect an academic master's level and the choice of subjects for the thesis connects well to the programmes intended learning outcomes. Although the integration of the areas of supply chain management and transport economics is not an explicit intended learning outcome, the panel considers the existing option for students to make a choice between these two areas in their thesis as a missed opportunity to fully realise the programme's unique, integrative profile.

The panel concludes that the level of the theses compares very well to the international standards. The choice of topics demonstrate that the students are strongly interested in the investigation of current real-world developments. The theses are concise and address the relevant methodological issues. The panel observes that the theses show that students have obtained the programme's learning outcomes and is positive about the ethical reflection of students. The job market perspectives for graduates of the programme are outstanding.

Assessment of this standard
The considerations have led the assessment panel to conclude the programme to meet standard 4, achieved learning outcomes.

5. Overview of assessments

Standard	Assessment
Standard 1. Intended learning outcomes	Meets the standard
Standard 2: Teaching-learning environment	Meets the standard
Standard 3: Student assessment	Meets the standard
Standard 4: Achieved learning outcomes	Meets the standard
Programme	Meets all standards

6. Recommendations

In this report, the panel listed a number of recommendations. For clarity, these have been brought together below:

- to define more specifically the integral vision on the two areas of supply chain management and transport economics;
- to strengthen the integration between the above-mentioned areas, and make this more visible in the structure of the curriculum and the nature of the theses subjects;
- to keep up with the dynamics of technology in supply chain and to include a pro-active approach towards changes driven by digitalization;
- to include a (network and supply chain) design perspective in the methodological approaches taught to students;
- to implement the systematic review of thesis involving external experts;
- to improve the variety in the extent to which supervisors elaborate on strengths and weaknesses of the student's achievement on the several criteria in the thesis form.