Assessment report
Limited Framework Programme Assessment

MSc in Transport, Infrastructure and Logistics
Delft University of Technology

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 Master Programme Transport Infrastructure and Logistics of Delft University of Technology. 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, Infrastructure and Logistics aims to entail its students with knowledge and understanding of the complexities of Transport-related challenges. The programme builds on a distinction of relevant disciplines or areas of transport: Policy, Design, Operations and Engineering. Students choose a specialisation within one of these disciplines. Due to its embeddedness in research groups with a strong connection to industrial and governmental organisations, the programme is able to provide students with specialised insight and knowledge in these different disciplines. In addition to the distinction in disciplines, the programme has defined three relevant perspectives toward challenges in transport: the machine perspective considering vehicles which are used for transport, the infrastructures involved in transport networks and the organizational perspective, focusing on the organization of transport and the people involved in it. The programme is unique in the breadth of transport sectors in which students can specialize, as is shown by the elaborate benchmark with other programmes across the globe. The learning outcomes of the programme reflect well a master's level and have an academic orientation. The panel assesses the programme's intended learning outcomes, standard 1, as good.

The panel observes that the programme's admission policies are adequate and that the programme allows students that enter the programme to obtain the intended learning outcomes. The programme starts with a set of compulsory courses in order to facilitate that students with various backgrounds get to understand each other's perspectives and have the opportunity to form a community. The courses introduce students to the four different disciplines and the related specialisations from among which the students can choose. In addition to courses belonging to the specialisation and elective courses, all students work on a design project and a research project. Students complete their studies with their master's thesis. The programme offers a mix of teaching methods and provides students with opportunities to interact with the professional field. The panel concludes that the teaching methods are well chosen. The panel observes also that there is room for improvement with regard to the study success rates. The programme is delivered by staff members who are experts in their field. Since staff members reside within three different faculties and courses are also used in other programmes, the programme management makes an effort to stimulate the establishment of a community of staff members by organizing staff meetings. Since student numbers have increased over the last couple of years and some research groups experience a considerable workload, the panel recommends the programme to ensure sufficient that staff is available. The panel assesses the programme's teaching and learning environment, standard 2, as satisfactory.

The programme's assessment policies rest on the assessment policies of the faculty. Lecturers draft an assessment matrix, which is used in order to provide assessment methods which are in line with the course objectives. The programme additionally designed an assessment matrix for the courses that are specifically developed for the master programme, stimulating the use of similar criteria in these courses. In order to assess the thesis, the programme provides graduation committees with a rubric. The panel has established the rubric is adequate, however, the consistency in the particular use of the rubric by different committees could improve.

The composition of the Board of Examiners reflects the various faculties involved in the programme. The Board fulfils its legal duties, the panel recommends the Board to smoothen the information provision on the courses which fall under the authority of other Boards of Examiners within the University. The panel assesses standard 3, assessment, as satisfactory.

The panel is positive about the quality of the theses it reviewed. The work displays specialised knowledge obtained by graduates, in a range of relevant subjects. In addition, the theses show graduate's analytical skills and the ability to engage in academic research. Graduates of the programme find employment in which they use and apply the obtained knowledge and skills. The demand for graduates is high, students sometimes even start their job before graduation. The professional field is positive about the quality of the programme's graduates. The panel assesses standard 4, achieved learning outcomes, as good.

The panel that conducted the assessment of the Master Programme Transport, Infrastructure and Logistics of Delft University of Technology assesses this programme to meet 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 good. Therefore, the panel recommends NVAO to accredit this programme.

Rotterdam, 12 april 2019

Prof. dr. P. Bosch
(panel chair)

Jetse Siebenga MSc.
(panel secretary)

2. Assessment process

The evaluation agency Certiked VBI received the request by Delft University of Technology to support the limited framework programme assessment process for the Master Transport, Infrastructure and Logistics of this University. 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 management of the programmes in the assessment cluster Civil Engineering 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:

- Prof. dr. Petra Bosch, Professor of Management, Technology and Innovation, Chalmers University of Technology (Chair);
- Prof. dr. Jos Arts, Professor of Environmental and Infrastructure Planning, University of Groningen;
- Prof. Dr. Ir. Geert de Schutter, Professor of Concrete Technology, Ghent University;
- Ir. Adriënne van der Sar, Deputy Staff Director of the Delta Programme Commissioner;
- Quinten Swanborn BSc, student Master Industrial Engineering & Management, University of Groningen.

On behalf of Certiked, J.W. Siebenga MSc. served as the secretary in the assessment process. The overall coordination of the assessment cluster Civil Engineering was executed by drs. W. Vercouteren.

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, the 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 15 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 the 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 4 December 2018, the panel conducted the site visit on the Delft University of Technology campus. 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, professional field 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.

Clearly separated from the process of the programme assessment, the assessment panel members and programme representatives met to conduct the development dialogue, with the objective to discuss future developments of the programme.

The assessment 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. The programme management was given three 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 re-accreditation of this programme.

3. Programme administrative information

Name programme in CROHO:	M Transport, Infrastructure and Logistics
Orientation, level programme:	Academic Master
Grade:	MSc
Number of credits:	120 EC
Specialisations:	n.a.
Location:	Delft
Mode of study:	Full-time (language of instruction: English)
Registration in CROHO:	21PF-60361
Name of institution:	Delft University of Technology
Status of institution:	Government-funded University
Institution's quality assurance:	Approved (valid until 20/11/23)

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.

Findings
The programme aims to provide graduates with the ability to understand transport systems in order to provide solutions to transport challenges. Students are able to approach transport challenges from three perspectives: the transport machines, related infrastructure and the organisation of logistics. Graduates understand the complexity and interconnectedness of transport systems and are familiar with definitions and terminology used in various disciplines related to transport systems. They are competent to work in multidisciplinary professional settings on complex problems. They have strong analytical skills and a scientific attitude towards these problems. In addition, they are aware of contextual aspects such as the ethical, social, environmental, aesthetic and economic implications of a solution. Graduates have competence to make judgements in which these aspects are included.

The programme drafted the intended learning outcomes in accordance with the Meijers Criteria, which have been developed by the 3TU Federation and are related to the Dublin Descriptors and level 7 of the Netherlands Qualification Framework (NQLF). In addition, the programme has compared its intended learning outcomes to the international requirements for MSc. programmes in engineering as specified by the international Accreditation Board for Engineering and Technology (ABET).

In recent years, the programme has been revised by which the number of specialisations has been diminished from ten to four. In the current programme, students can obtain specialist knowledge in one of the following four disciplines: the (i) policy discipline, focused on transport systems within policymaking frameworks, the (ii) design discipline, focused on the design of large networked systems, the (iii) operations discipline, focused on the real-time operation of actual systems and the (iv) engineering discipline, focused on the engineering of logistics in these systems. All the specialisations are covered by the intended learning outcomes.

In the self-evaluation, the programme provided a list of organisations in the professional field it relates to. The list contains both private and public entities and covers a wide range of roles and functions executed in the profession. The relations with the professional field have mostly been developed primarily through cooperation in research projects. They have recently been formalized to the benefit of the educational programme. The recently established Societal and Industrial committee gives feedback to the programme on a regular basis, on a broad spectrum of topics.

The programme has provided a benchmark with five other programmes, offered by universities spread over Asia, the USA and Europe, which have been in the top of ranks of the Shanghai University Ranking. The benchmark is profound in the sense that it covers a wide range of aspects, and is structured according to NVAO's assessment framework. The uniqueness of the programme mainly lies in the fact that the programme is comprehensive in the area of transport. Core engineering perspectives are well integrated with infrastructure and organisational perspectives. The programme specifically stands out by offering the machine perspective across different modes of transport, including maritime transport.

Considerations
The panel is positive about the intended learning outcomes of the programme. They are very well defined and provide a clear, overall picture of the skills and knowledge obtained by the programme's graduates. The panel has observed that the intended learning outcomes cover the content of all the specialisations of the programme. The intended learning outcomes reflect a master's level and have an academic orientation. The panel suggests to consider to draft more specific intended learning outcomes for each of the specialisations of the programme, these being specifications of the

programme intended learning outcomes. The panel believes this would better reflect the specific features of the specialisations.
The panel was impressed by the benchmark provided by the programme. It portrays an international landscape of comparable programmes in which the programme has a clear position. The panel is positive about the revision of the programme: it provides the field of transport and engineering with a clear picture of the specialisation of the programme's graduates. The programme's connection to industry are ample and allow the programme to be on top of developments in the professional field. The panel is overall, very positive about the intended learning outcomes and the approach of the programme.

Assessment of this standard
These considerations have led the assessment panel to assess standard 1, Intended learning outcomes, to be good.

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 is a joint initiative of three faculties (Mechanical, Maritime and Materials Engineering, Civil Engineering and Geosciences and Technology, Policy and Management). The programme is formally governed by a board consisting of the three deans of these faculties. A steering committee, consisting of representatives of each faculty meets with the director of studies twice a year to discuss the programme on a strategic and tactical level.

The Faculty of Civil Engineering and Geosciences acts as the coordinating Faculty. The Director of Studies of this Faculty has the managerial responsibility for the programme; the daily management of the programme is in the hands of the programme coordinator who acts as the Deputy Director. The Board of Studies, being composed of lecturers and students, advises the programme management on the quality of the programme, the Teaching and Examination Regulations as well as the implementation of the Teaching and Examination Regulations. The Board of Examiners has the authority to ensure the quality of the examinations and assessments of the programme.

The programme directly admits students with a relevant BSc. degree from a Dutch University. International students have to have a relevant BSc. degree and a cumulative Grade Point Average of 75% of the scale used in their national system. Students with a Bachelor degree in Industrial Engineering, Architecture, Urbanism and Building Sciences or Spatial Planning are offered a 9 EC programme which can be taken as electives and which allows them to recuperate their deficiencies during the programme. Students can commence their studies either in September or in February. The number of students entering the programme has increased over the last six years. In academic year 2011-2012, 29 students entered the programme. Over the last three years, an average of almost 80 students entered the programme. The influx of international students has been rather stable with 13 students. Because the entry requirements (mathematics, statistics and language skills) have become stricter in recent years, the number of international students did not rise equal to the overall number of students entering the programme.

The dropout percentages per cohort fluctuate between 10% and 13%. The study duration decreased in recent years and is on average of 2.6 years for the 2010/11 until 2015/16 cohorts. The percentage of students obtaining their degree in two years was 7 for the academic year 2014/15 and 9 for the year 2015/16. In the years 2013-14 and 2014-15, respectively 60% and 53% of the students obtained their degree within three years. Students taking more time than the scheduled two years, often do so to be able to engage in cooperation with external parties for their design project or thesis project. Some students study more courses than 120 EC. The Board of Studies has investigated whether there are specific courses which cause a delay and concluded that the courses where students need to cooperate within a larger group of students and engage in projects with the professional field, can cause study delay.

Students admitted to the programme receive a programme navigator, which allows them to orient on the specialisations within the programme and the courses on offer. The programme distinguishes a generalist learning line, a specialist learning line and a research and design projects learning line.

All students start the programme with a course in research and design methods and the course Transport Engineering and Logistics. These courses provide students with a firm basis in design and engineering, critical thinking and scientific methods. In a small project, students experience the differences in each perspective and benefit from each other's talents and expertise. The courses are part of the generalist learning line (27 EC), which continues throughout the first year. Students who start the programme in February follow a different sequence which results in a higher study load in some periods for students who decide to complete the programme within two years. The panel

observes that the programme's management monitors the coherence and feasibility of the programme continuously and solves issues when possible.

The specialist learning line consists of courses (27 EC) within one of the specialisations of the programme: Policy, Design, Operations and Engineering. All specialisations address the three perspectives of the programme. The courses are scheduled in the second half of the first year and in the second year. The six courses provide students with expert knowledge in each of the areas of specialisation. For the policy specialisation, these comprise transport, spatial and environmental policy. Courses include modelling infrastructures and methods for analysing infrastructures and the environment. The design specialisation focuses on transport service and infrastructure network design in the context of urban design, spatial planning and regional economy. The courses address airport and railway operations and control and students are introduced to travel behaviour research and airline planning and optimisation. Courses in the operations specialisation focus on the operational management and control of traffic in transport systems and the technologies and methodologies that facilitate this. Students are equipped with knowledge on traffic flow simulation and modelling, automated driving and safety. The engineering specialisation focuses on control and optimisation of transport and production systems and the supply chains to which these belong. Students take courses in analysis and modelling of freight transportation systems, real-time logistics and supply chain innovations. Students further specialise themselves by choosing elective courses (26 EC). The programme offers a set of related courses and has structured these in order to guide the student's choice.

In addition to the courses described above, all students work on a research project and on a design project. The research project aims at enabling students in drafting a research proposal. In the design project, students work in groups on the analysis and design of a complex system, carry out experiments and learn how to concisely document research outcomes. Students work in groups and are allowed to cooperate with an external party but this demands a very pro-active attitude of students since agreements on the cooperation have to be made in advance of the start of the course. Since students sometimes fail to make these agreements well in advance, but are eager to engage in cooperation with external parties, they tend to delay their studies.

The programme offers a mix of didactic approaches involving coursework and lectures, individual assignments and group work. The panel observes that the programme offers students ample opportunities to connect with industry. Some courses allow for small-scale education such as seminars during which students discuss academic papers. Staff members appreciate these methods since it allows them and the students to go deep into the subject and guide student's understanding at a profound level. Since the number of students increased over the last couple of years, some courses that are tailored to a low number of students have been revised. The programme management and lecturers are mindful of the scalability of the courses, in order to be able to more easily accommodate larger groups of students. The panel received examples of how staff members had been able to scale up their lectures and attend a larger group of students. In order to carry out experiments, various laboratories are available to the students, amongst which the Maritime & Transport Technology Lab and the research lab for automated driving as well as the ITS-Edulab – a collaboration with the University and Rijkswaterstaat in which students, PhD-students and Rijkswaterstaat collaborate on problems in traffic management.

Students are guided throughout the programme by the previously mentioned course navigator. During a workshop, the programme provides students halfway the first semester year with a toolbox, containing an overview of the various specialisations, enabling students to make an informed decision on their specialisation and elective courses. Student guidance is mainly provided by teaching staff and the programme coordinator. International students are welcomed during a university-wide pre-introduction. They meet with fellow students from the Netherlands soon afterwards, during the intensive first full-week schedule in week 1. Academic counsellors play an important role in student

guidance. Students can turn to them for a broad variety of study-related topics. International students are pro-actively monitored by the academic counsellors.

Students conclude their programme with an individual thesis project. The project aims for students to independently set up and carry out a research or design project. Students work on a complex transport problem that requires bringing together multiple perspectives to obtain an interdisciplinary solution and incorporates the application of theories and methods. The process of the thesis writing is clearly structured; a committee, consisting of three members, which represent at least two of the participating faculties, supervises students. The student meets at least four times with the committee.

The programme is delivered by 74 staff members (25,4 FTE), resulting in student-staff ratio of 7:1. The programme considers this as adequate but is mindful of possible growth in student numbers and the effect it might have on the workload of staff members. Some of the research groups to which staff members of the programme belong, mention a high workload.

Since the staff members work at three different faculties, the programme organises teacher meetings where staff members involved in the programme discuss the programme, its specialisations and the supervision of Design and Graduation projects.

Considerations

The panel is positive about the teaching and learning environment of the programme. The programme is clearly driven by ambitious staff members and enthusiastically coordinated by the leading faculty. In this regard, the panel is positive about the staff meetings organized by the programme. The panel recommends the programme to consider hiring more staff in order to better equip the research groups that report a very high workload, but also to be able to manage a possible increase of students.

The programme's admission policies are clearly formulated and the programme is structured in such a way that students with various disciplinary and national backgrounds are effectively levelled. However, students commencing their studies in February lack an effective introduction to the programme. Since the vast majority of the students commence the programme in September and since the programme does what given the complexity of the organisation of the programme is possible, the panel concludes this as an acceptable situation. It recommends the programme to keep investigating whether the programme can be organised in such a way that students who start the programme in February follow a more feasible programme.

The intended learning outcomes are reflected in the courses and the programme ensures that students obtain all the intended learning outcomes, irrespective of the study path they choose. The content provided in the courses display the specialised character of the programme. The teaching methods used by the programme are well chosen and accommodate students in obtaining the intended learning outcomes. In addition to regular classes, students have ample opportunity to explore professional practice in the industry, allowing them to orient themselves to their future careers.

The panel has some recommendations for the programme. Since the study success rate is rather low, the panel recommends the programme to improve these success rates. In order to realise improved success rates, the panel recommends to take the design project into account, which has a high study load and demands an early preparation.

Assessment of this standard

These considerations have led the assessment panel to assess standard 2, Teaching-learning environment, to be satisfactory.

4.3 Standard 3: Student assessment

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

Findings
The programme's examination and assessment rules are derived from the Faculty's rules and regulations. The main principle on which the assessment system is based is that of constructive alignment, which aims to connect the intended learning outcomes to the learning goals for each course and the tested knowledge and skills in each course. The programme also developed a grading rubric for courses that have been designed specifically for the programme and are not part of other programmes. This grading rubric is an instrument to stimulate alignment in grading practices between staff members from different faculties. The rubric can be adapted according to the assessment methods used in a course. The rubric and assessment policies and practices are discussed during staff member meetings. Lecturers who teach courses not specifically designed for the programme, draft an assessment matrix which is used in order to develop the tests. Within the faculty of Technology, Policy and Management, a co-assessor is appointed for each course, who reviews the answering models and exams, in order to enhance the reliability of the tests. The programme is discussing whether this policy should be extended to the programme as a whole, whereas some individual staff members from the two other faculties informally have adopted this practice as well.

Staff members who have obtained their UTQ can be appointed as examiner. They are trained in drafting assessments in a reliable and valid manner. The digital study guides provide students with information on learning objectives, assessment methods, and how the final grade is determined. The grading rubrics are made available to students well in advance.

The programme uses not only end-of-term summative assessments but also uses formative assessment in order to enhance the amount of feedback students receive so that assessment also stimulates the student's learning process. Assessment methods used in the programme are written exams, written reports, computer practicals, oral exams and group work assessment. In case of the latter, the individual contribution of a student is recognised and free-rider behaviour is strongly discouraged. The balance between the various forms of assessment for the programme as a whole is the responsibility of the Director of Studies and the Board of Examiners.

For the assessment of the thesis, a rubric has been developed and is in use. The assessment of the thesis involves three assessors. The panel studied 15 theses and the assessment forms. The comments on the assessment forms are in general sufficient, but a slight variation in the amount of written feedback is notable. The assessment form allows staff members to fill out partial grades, which in some cases have been filled out but in other cases were missing. In one case the partial grades given and the written comments do not logically relate to the final grade given.

In the Board of Examiners, each faculty is represented. The Board meets on a regular basis and checks the assessment for each course which has been developed specifically for the programme. In addition, it annually reviews the grading of students' coursework and the thesis. Typically, five or six theses are selected to this end. Courses which are also part of other curricula fall under the authority of other Boards of Examiners. The Board of Examiners for the programme is not informed about the assessment policies and practices of these courses.

Considerations
The panel is positive about the assessment system in place. The rubrics used by the programme are a good instrument to enhance reliable and valid testing. Students are well informed on the assessments so that assessment is transparent. The programme management takes initiatives to ensure that staff members within the programme have a common approach towards assessment.

The programme uses a range of assessment methods. The methods used by the programme relate to the content of the courses and the learning goals of the individual courses. The assessment of the thesis is adequate. Grading of the thesis is calibrated and the programme has mechanisms in place to ensure the objectivity of the grade given. The rubrics provided to staff members in order to assess the thesis are fit to this end. The extent to which staff members use the rubrics in a consistent manner could improve, the panel recommends the programme to take measures in this regard.

The Board of Examiners performs its duties as it should but could expand the scope of its work since this is limited to a number of courses. The panel recommends the Board of Examiners to pro-actively gain insight in the quality of assessment practices in courses which formally fall under the authority of other Boards of Examiners within the University.

Assessment of this standard
The considerations have led the assessment panel to assess standard 3, Student assessment, to be satisfactory.

4.4 Standard 4: Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings
The panel has studies 15 theses. In observes that students choose to research topics that fit their specialization and address relevant developments in the field of transport and engineering, such as blockchain, automated vehicles and shared services. Students use a variety of methodology in order to research a question or challenge. The panel also observes that there are differences in the extent to which students reflect on their choice for research methodologies.

The graduates of the programme find employment as consultant, manager, analyst, engineers, trainees and PhD students. The demand is high: students find a job either before or directly after graduating. A quarter of the graduates are contracted by companies they worked with during their studies. The programme management performed an analysis of the job development of its alumni. This shows that as graduates move along in their career, they move to managerial positions. Results of a survey among representatives from the professional field show that graduates have strong knowledge, analytical and design skills. For specific types of projects, disciplinary knowledge is less deep, according to the professional field. To the programme, this comment reflects the profile of the graduate as a so-called ‘T-shaped professional’: generalist in understanding the complexity of transport-related challenges with specific and deep knowledge in a certain disciplinary field.

Considerations
The panel is positive about the quality of the MSc theses, these are of good, scientific quality. The theses reflect the intended learning outcomes and show that students have obtained these learning outcomes. The theses are regarded by the panel to be up to standard. The panel agrees to the grades given by the programme examiners. The panel finds the differences in the extent to which students reflect on their choice of research methodologies acceptable and has established these are concurrent with the research topics and designs.

The programme’s graduates answer to a need in the professional field. Graduates easily find employment in which the knowledge and skills they obtained during the programme is of high relevance. The panel compliments the programme for the effort made to analyse alumni’s career and employer’s view on the quality of its graduates.

Assessment of this standard
The considerations have led the assessment panel to assess standard 4, Achieved learning outcomes, to be good.

5. Overview of assessments

Standard	Assessment
Standard 1. Intended learning outcomes	Good
Standard 2: Teaching-learning environment	Satisfactory
Standard 3: Student assessment	Satisfactory
Standard 4: Achieved learning outcomes	Good
Programme	Good

6. Recommendations

In this report, a number of recommendations by the panel have been listed. For the sake of clarity, the most important ones have been brought together below. The panel recommends the programme:

- to ensure sufficient staff is available, especially within research groups that report a high workload and keeping in mind that student numbers of the programme have increased over the last three years;
- to improve the study success rates;
- to enhance a consistent use of the rubric used in order to assess the thesis;
- to ensure that the Board of Examiners is informed about courses that fall under the authority of other Boards of Examiners within the University.