DESIGN FOR our future

TU Delft

# IDE Master Graduation

## Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

**USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT**

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

### STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name: Kuiper
initials: J.J. given name: Jelle - Jacob
student number: [redacted]
street & no.: [redacted]
zipcode & city: [redacted]
country: [redacted]
phone: [redacted]
email: [redacted]

Your master programme (only select the options that apply to you):

IDE master(s): ( ) IPD (★) DfI ( ) SPD
2nd non-IDE master:
individual programme: - - (give date of approval)
honours programme: ( ) Honours Programme Master
specialisation / annotation: ( ) Medisign
( ) Tech. in Sustainable Design
( ) Entrepeneurship

### SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair: Suzanne Hiemstra-van Mastrigt dept. / section: SDE/M&M
** mentor: Tomasz Jaskiewicz dept. / section: HCD/DDC
2nd mentor: Claudia Spaargaren
organisation: TU Delft, Seamless Mobility Lab
city: Delft country: The Netherlands

comments (optional)

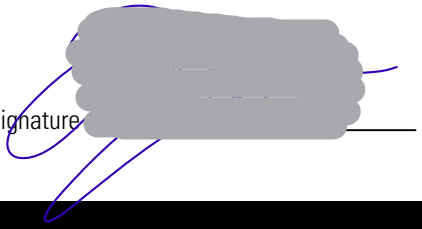
Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

Second mentor only applies in case the assignment is hosted by an external organisation.

Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

## APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Suzanne Hiemstra-van Mastrigt date 16 - 04 - 2020 signature 

## CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC

Of which, taking the conditional requirements into account, can be part of the exam programme _____ EC

List of electives obtained before the third semester without approval of the BoE

YES all 1st year master courses passed

NO missing 1st year master courses are:

name _____ date - - signature _____

## FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **.
Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED NOT APPROVED

Procedure: APPROVED NOT APPROVED

comments

name _____ date - - signature _____



Initials & Name J.J. Kuiper Student number 4209796

Title of Project Personal Mobility: The Sustainable Commute

Personal Mobility: The Sustainable Commute

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 02 - 03 - 2020

20 - 07 - 2020 end date

## INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

We live in challenging times, with the exhaustion of our planet just around the corner we need to look into sustainable alternatives to construct our future. According to the climate agreement of Paris, in 2030 the Netherlands will have reduced its emissions with 49% compared to its emission in 1990. This goal is ambitious and should be practised in all industries, including the personal mobility industry, in order for it to succeed.

The Dutch Institute for Transport Policy Analysis (KiM) state that traffic and transport, excluding international aviation and the shipping industry, are responsible for 20% of the total CO2-emission in the Netherlands. This shows that personal mobility can play a significant role in achieving our societal goals regarding sustainability in 2030.

However, these ambitions collide with what we perceive in our country. The demand for mobility is increasing and the current infrastructure of the Netherlands is over-saturated with public and private transport. This growth of mobility underlines an opportunity to create sustainable mobility alternatives for the people that are willing to commute in a sustainable way.

Many citizens recognize the need to take responsibility and to behave in more sustainable ways. Even though they would like to make changes in their behaviour regarding mobility, it is not always apparent what these changes should be. However, the concept of Mobility-as-a-Service (MaaS) can provide opportunities in supporting commuters who are willing to decrease their CO2-emissions during their daily commutes.

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introduction (continued): space for images

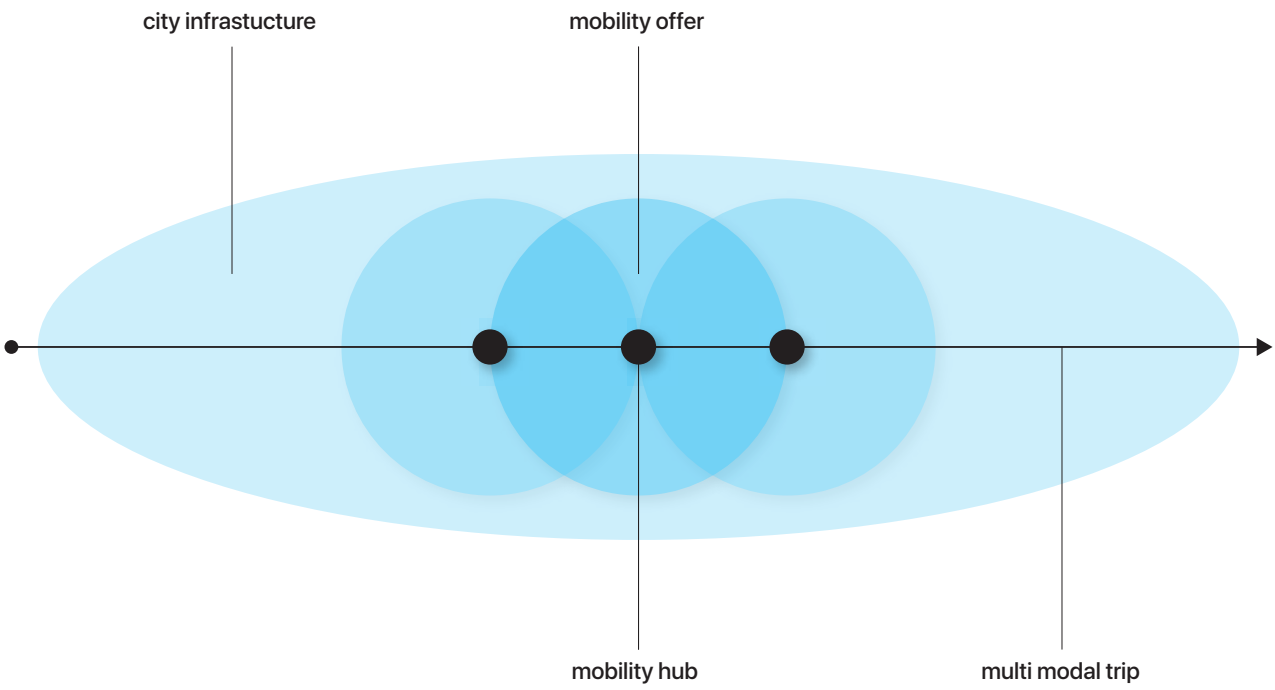


image / figure 1: Mobility as a Service cornerstones (Kuiper, 2020)

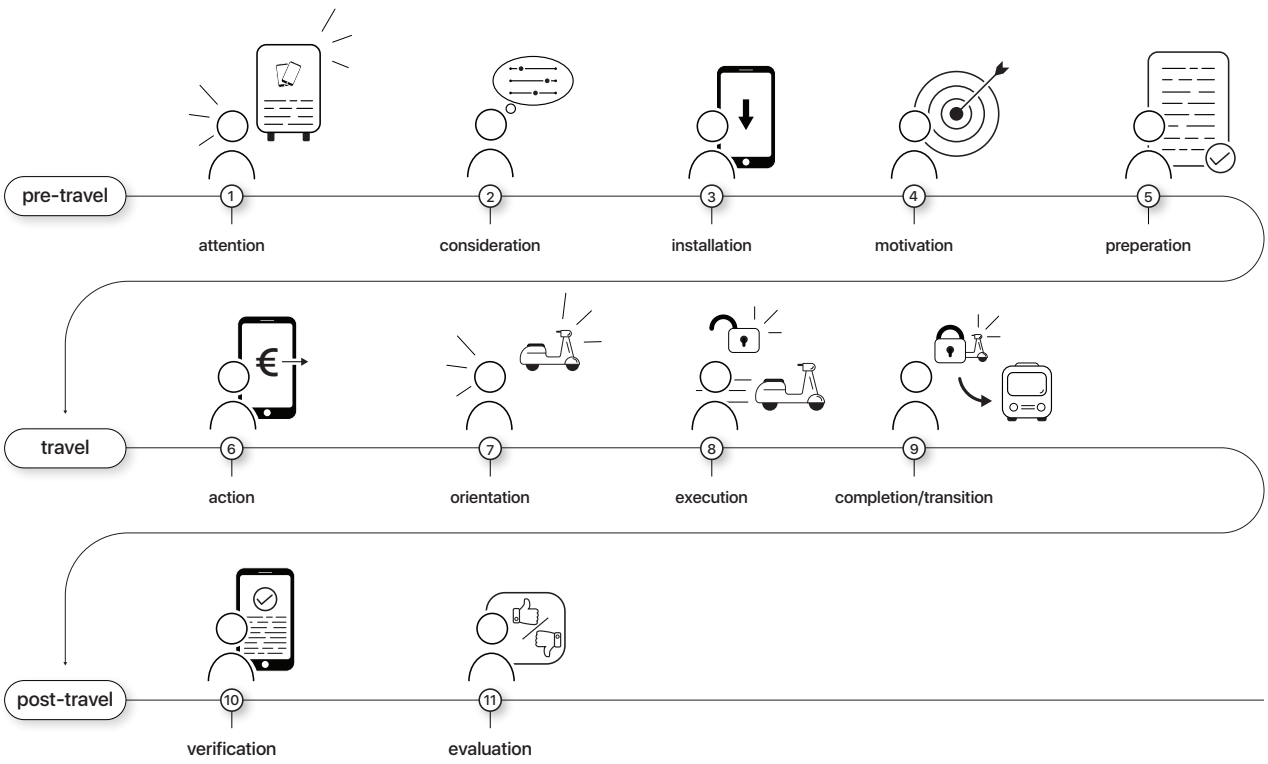


image / figure 2: Different multi-modal travel stages (Kuiper, 2020)



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Title of Project Personal Mobility: The Sustainable Commute

## PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Mobility as a Service (MaaS) is a flexible, multimodal mobility service that enables users to plan, pay, book and modify their journey in real-time in a one-stop-shop fashion. Possible positive effects are a better spread of public transport and traffic, an increase of sustainability in personal mobility, and wider accessibility of hard-to-reach regions. Therefore, the Dutch Ministry and transport operators within the personal mobility industry are looking into MaaS and its benefits as a solution for the future of mobility in the Netherlands.

More specifically, MaaS is an opportunity to form a breeding ground for sustainable commuting solutions and increase environmental awareness amongst travellers. This can, for example, be done by educating travellers on the positive or negative impact of their travel behaviour and/or illustrating trade-offs between time and emissions or their commutes.

MaaS consists of four cornerstones: 1. The personal mobility offer in an area. 2. The use of mobility hubs, for transitioning between modes. 3. The city and its infrastructure regarding mobility. 4. The use of multimodal trips (Kuiper, 2020).

The use of multimodal trips will form the base and at the core will be the commuters who are willing to travel in a more sustainable way. As stated by CBS, 30% of all personal mobility kilometres made in the Netherlands consist of commuting traffic. This unveils the opportunity that the biggest positive impact is to be made within trips between work and home, hence my focus for this project. Furthermore, there are two methods to decrease CO2-emissions: by decreasing kilometres made; and by lowering CO2 emissions during these kilometres. My focus will be on the latter as it is more in line with the multimodal approach. The challenge, however, is to find the balance between making sustainable commuting a viable option for commuters on the one hand, and not having the commuters to compromise on travelling values such as speed, comfort, convenience, etc. on the other hand.

## ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... . In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

Design a service that supports commuters who want to decrease their CO2-emissions during their daily commutes, utilising Mobility as a Service principles.



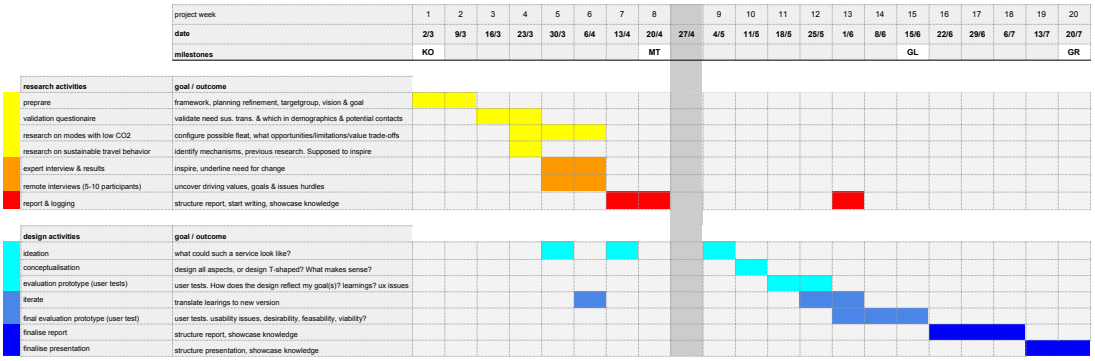
Initials & Name J.J. Kuiper Student number 4209796

Title of Project Personal Mobility: The Sustainable Commute

## PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 2 - 3 - 2020 20 - 7 - 2020 end date




zoom in for visibility

holiday break in week of 27/4



Initials & Name J.J. Kuiper Student number 4209796

Title of Project Personal Mobility: The Sustainable Commute

## MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... . Stick to no more than five ambitions.

- Learn to deal with complex service systems.

- Learn to deal with complex contexts and human-technology interactions

- Learn to plan, structure and execute more specifically to minimise stress and maximise overview.

- Experiment with designing for future solutions

## FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Impact of COVID-19 measures will affect user testing activities, which will need to be conducted online/at a distance. Also, with the majority of people currently working from home, there are hardly any commuting trips right now.

Reference: Kuiper, J.J., 2020. Mobility as a Service: Exploring travel patterns, behaviours and preferences of travellers. Research elective report, DDL Seamless Mobility Lab, Delft University of Technology, Delft, January 2020 (draft).



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