Project HUMAM

Hub for Urban Mobility for Amsterdam Metropolitan area.

Reflection paper

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Cross Domain Studio lab

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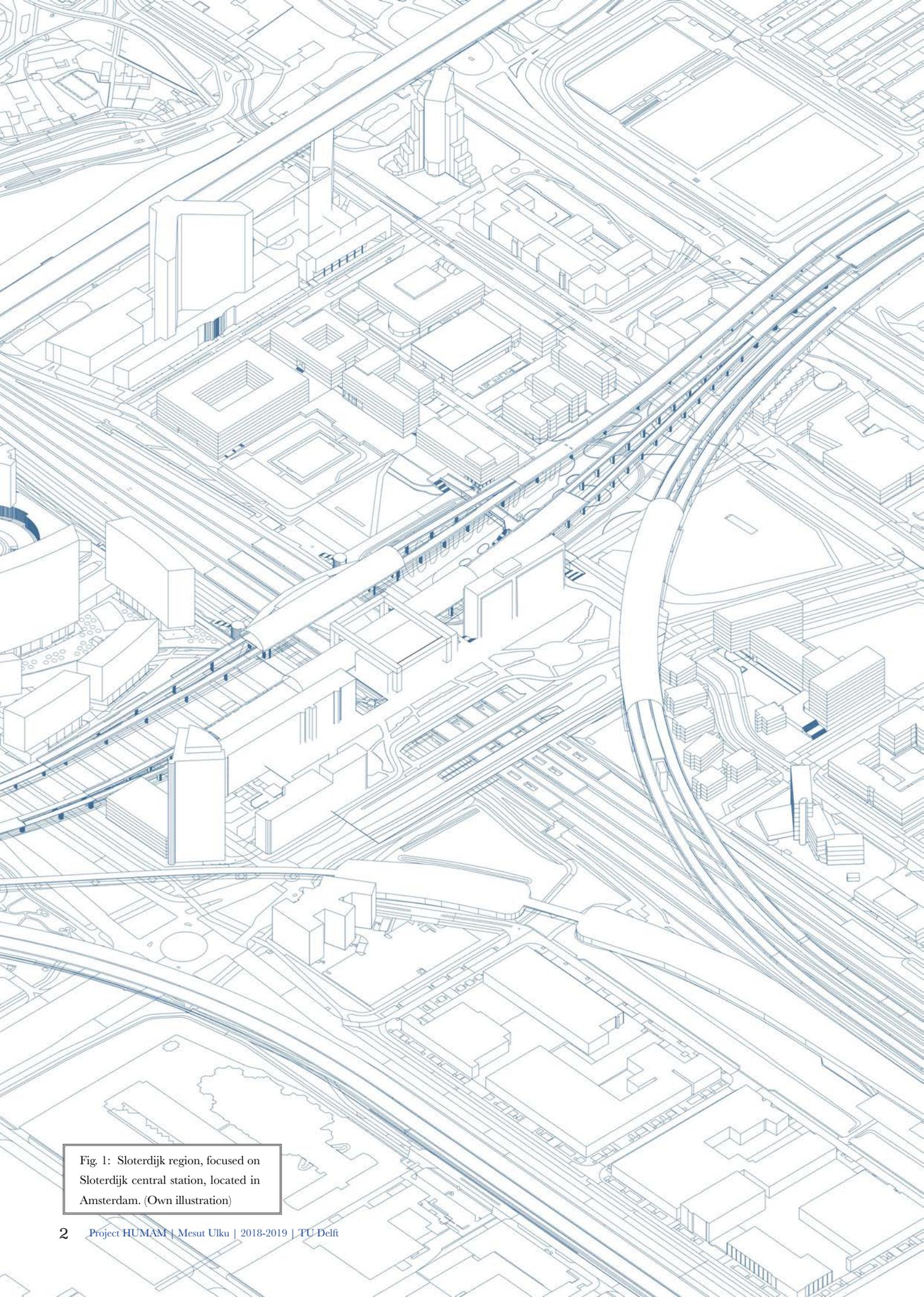Board of Examiners delegate: Prof. Dr. ir. arch. Sevil Sariyildiz

Fig. 1: Sloterdijk region, focused on Sloterdijk central station, located in Amsterdam. (Own illustration)

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0. Introduction

This reflection paper is part of the graduation studio: "City of the Future", which is part of the chair of Cross-Domain (X-Domain) studio Lab of the TU Delft. With close companionship with the homonym multidisciplinary research initiative launched by the BNA (Bond van Nederlandse Architecten), the biggest municipalities of the Netherlands and DIMI, the City of the Future is working towards an integrated way of sharing perspectives about our multi-faced future challenges of urban environments with one central question: How can we design and develop a transformation area in an integral way into an attractive and future-proof urban environment?.

This project focuses on the future demands of the Amsterdam Municipality in which they expect an increase of 70.000 new households and 50.000 new working areas over the coming 30-40 years in Havenstad area, which is located in Sloterdijk (Figure 1). The city is characterised by its rich history and remarkable growth over the hundreds of years. For Amsterdam Sloterdijk, this expansion was mainly focused on the industrial sectors, resulted in an area where only a fraction of the people lives. When researching and analysing the city, it became clear that the leading cause of these differentiations between Sloterdijk and its adjacent regions can be summarised by the so-called 'four-problem-factor'; mono-functional, car-dominance, too many open areas, and the separation between Havenstad and the rest of Amsterdam.

According to the Municipality, one of the problems that cover up most of the problems is the automobile. For many years, we have all been brought up with the ambition of the car in our street scene. However, we are not always aware of the causes that these means allow us; poor health, fine dust particles, congestion, accidents, but also the separation from our urban planning qualities due to the growth of our infrastructure. By looking at innovative possibilities, there must be a balance between a healthy and sensible choice.

Therefore, project HUMAM will analyse and research the Sloterdijk area, to accommodate a transportation hub for the city (Figure 2). This hub enables the district to ban the car and put the focus on Automated Vehicles and shared possibilities. To keep Sloterdijk connected, the hub will perform as the catalyst for the area. For this project, I endeavour to posit a vision of a future where anyone in the city can go wherever they want, whenever they want to, and accordingly, a place where we share our spaces in total connectivity with our mechanic neighbours.

As a result, the problem I am facing is: How can the design of a transit hub address the car problem and the expected higher density in Sloterdijk area?

Fig. 2: Masterplan of Project HU-MAM including legend (Own illustration)
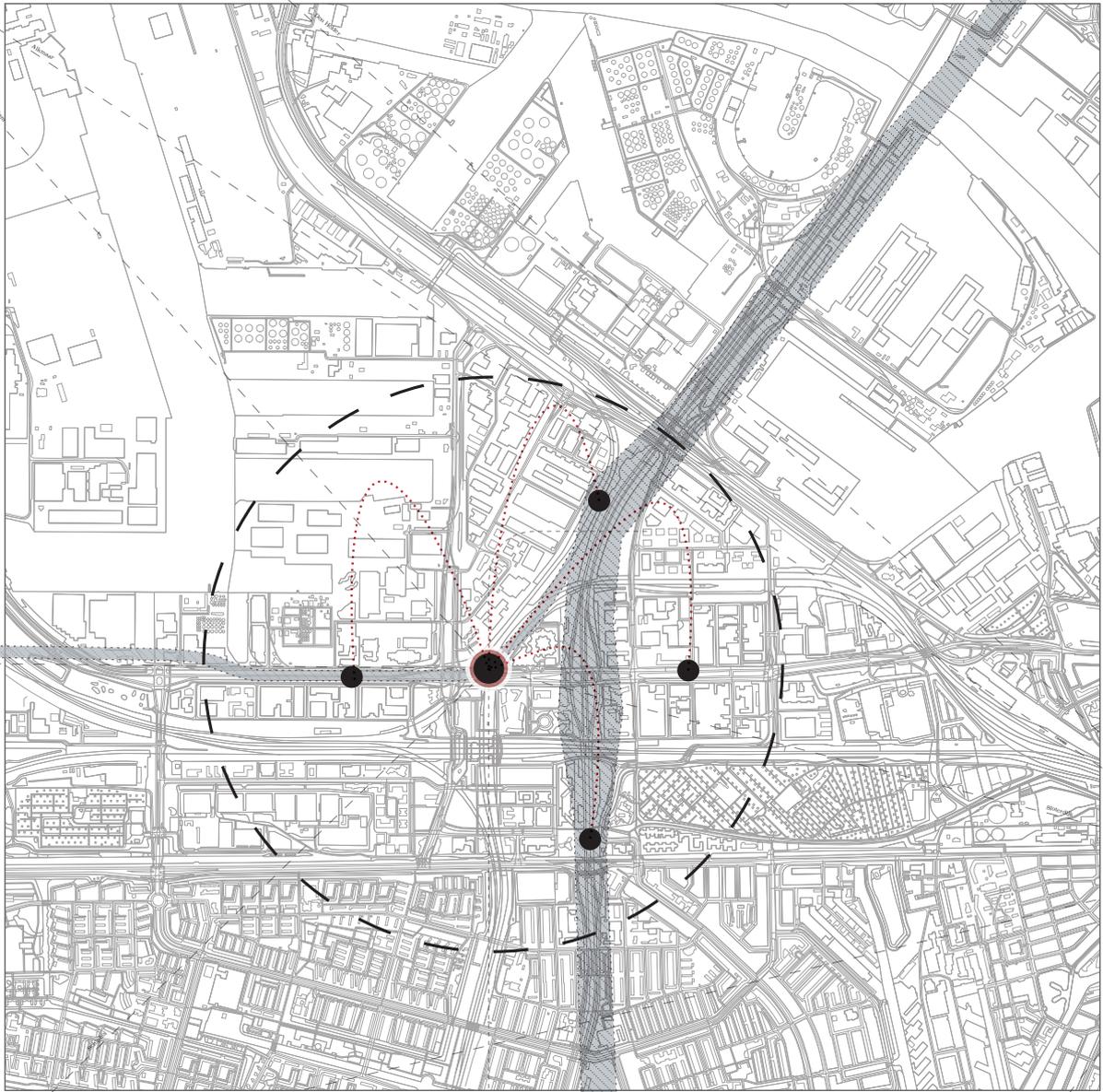
MASTERPLAN
PROJECT HUMAM MESUT ULKU

● Mothership hub

● Baby hub

··········· A10 + A5 highway

— — — Railroad

▬ ▬ ▬ Hub zone 3000 Ø

——— Approx. car-free zone

············ Transport connection

## 1. The relationship between research and design

The aspects of research and design are inextricably connected in the studio of the City of the Future. The studio, as being part of the chair of Cross Domain, mainly focuses on the urgent contemporary and future demands on different multi-disciplinary levels. By looking into possible innovations and demands from different stakeholders, important values need to be preserved in order to give the area a new function. The starting point of the critical values is to understand the great system transitions that are necessary for the major social tasks we currently face. One of these is the mobility systems. In order to understand the correlation between architecture and mobility, research of spatial and technological aspects became essential. Furthermore, it is therefore vital to understand the current development and how you will assume the future as your position as an architect. As a designer you have to show how you deal with these elements, which makes the documentation of it crucial for my graduation project.

During the first semester (P1 and P2) of this graduation year, I investigated the problems of what the city will encounter in the future. Thanks to the literature study I did on for example Luca Bertolini, I was able to find the source of this problem, where our economic growth is a result of increase in personal mobility (figure 3). Therefore, I saw the opportunity to put this in question, by analysing and applying new techniques and innovation (such as the use of big data) with architecture (Figure 5). However, it always became a mere utopian dream without any understanding of transportation on an urban level. The starting point of my research was therefore reading and following lectures about high-impact developments, such as Automated Vehicles (AV's) and the impact of transport in our social life. During the MSc. 2 City of the Future studio, I was charmed by the possibilities of architecture in a multi-disciplinary manner. I concluded to design a hub in which it can contribute to both disciplines. The topic of a hub follows from a broader social context; not only architecture but also transport engineering and civil engineering.

By working in a multi-disciplinary manner, I discovered the added value for my project. While attending the Venice Biennale Stad van de Toekomst workshop, I realized that people from different fields, operating in a different sector of the problem, a multi-disciplinary approach was therefore necessary, and suitable within the borders of Cross-Domain. With this in mind, my P1 and P2 graduation partner Gabriel Garcia from Geomatics and I decided to team up and work together on our project. Therefore, I experienced the true possibilities in the architectural field combined with technology. With our mutual collaboration, Gabriel was able to give me data input such as travel data from people in

Sloterdijk. On the other hand, I was able to help him with the design guidelines. I believe working together helped both projects to a new level. For me, working on this level was entirely new; working with data in architecture has always been a fascination. However, I realized that the task of applying data for 100% in my project was too much. In here, the research of data has been done, in which it also created a path I should walk for my design strategy between the P2 and P3. Working on the relation of research and design as a team with Geomatics became a valuable addition during my graduation process.

Fig. 3: Diagram of the impact of transportation systems on society (source: Luca Bertolini)
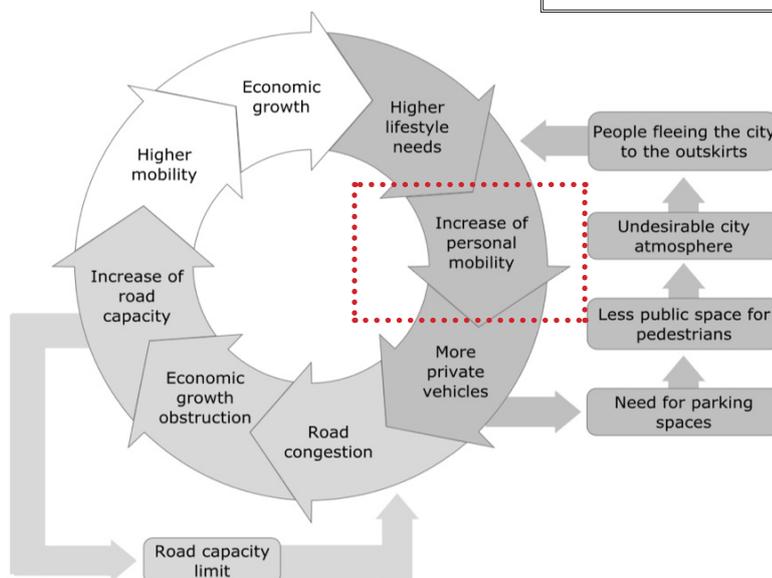
Duffhues, J., & Bertolini, L. (2016). From integrated aims to fragmented outcomes:
Urban intensification and transportation planning in the Netherlands.

Fig. 4 : The Hub should be able to
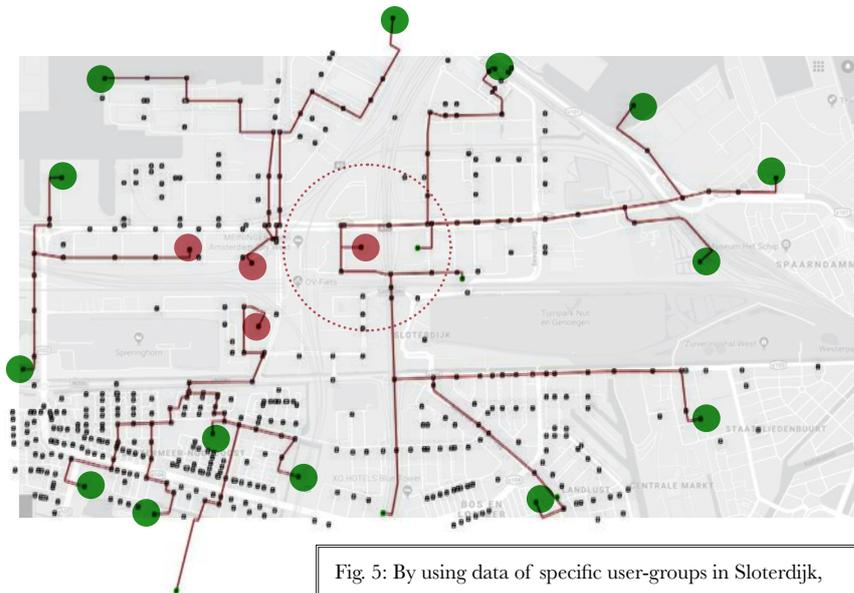accommodate all the cars within the
car-free zone (own illustration)

IMPROVED INFRASTRUCTURE

Mixed-use industry
+ residents

CAR-FREE ZONE
(+ new innovations)

Fig. 5: By using data of specific user-groups in Sloterdijk, it was able to find the optimal spot for a hub.
(Own illustration)

## 2. The relationship between the graduation project, the studio topic, and the master track architecture.

The City of the Future studio enabled me to explore the relation of a future we cannot predict. I discovered that this studio allowed me to cross the boundaries between the studio and the master track of Architecture. Since the start of my previous studio during MSc2, I became curious of working towards the uncertainty, a challenge that enables the architect, which is the mediator between the society and built environment, to project how I see the future. Therefore, I had the opportunity to talk with different professors and conducted several interviews with Gabriel to get more understanding of this connection between my project and architecture. One aspect I learned from mutual talks with Professor Maurice Harteveld from Urbanism, is that the 'optimal' does not exist. It is a mixture of political, cultural, financial and economic factors that shapes what we understand of 'optimal'. 'If a building looks appealing but does not show any societal qualities, it does not work; if it is too expensive, it does not work as well'. I discovered that the architect takes conditions into account and shapes according to the demand and tasks are given. The difficulty of finding this optimum was also faced during the meetings with Professor John Baggen from Transport. For my project I had to find a balance between an efficient and feasible transportation plan, while also meet the criteria on architectural level. The perfect balance of finding this was challenging, and I noticed to tackle all these issues of infrastructure, it would take more than just one graduation year. However, I believe I found the good balance between my interests in architecture with infrastructural influences, which is achieved by setting up conditions for myself. The studio gave me the perfect opportunity to explore this.

To continue from the latter, after my P2, I also noticed that architecture relies on flexibility in design, concerning the impact of my project to the urban area. The future is still uncertain, and so are assumptions and scenarios. I noticed that understanding the impact of a building to society while maintaining its flexibility to grow or shrink over time, can be seen as the central element of designing a hub for Sloterdijk, as an aspired architect. Therefore, I decided to make three themes for this project that characterises the effect of architecture in society, and so, connected to this studio (Figure 6). After my P2, I shifted my focus more on the impact and the changes it could take over time and how the building should behave. I believe that is much more important than fixating just by one scenario.

This relation between the project and the master track of architecture became one of my most interesting studies I discovered about the position of the architect. By giving it three themes, it gave me the right foundation to work towards the final P4. With the data received from Gabriel, and with the conditions made after the P2, the architect is the synthesiser of information. The society is its resource.

Fig. 6: The three themes that char-
acterizes the process of this project
(own illustrations)

Theme 1: Freedom
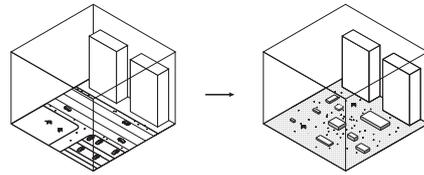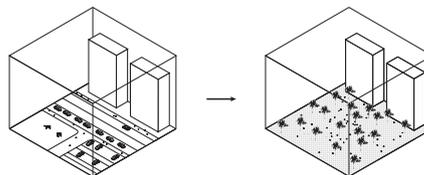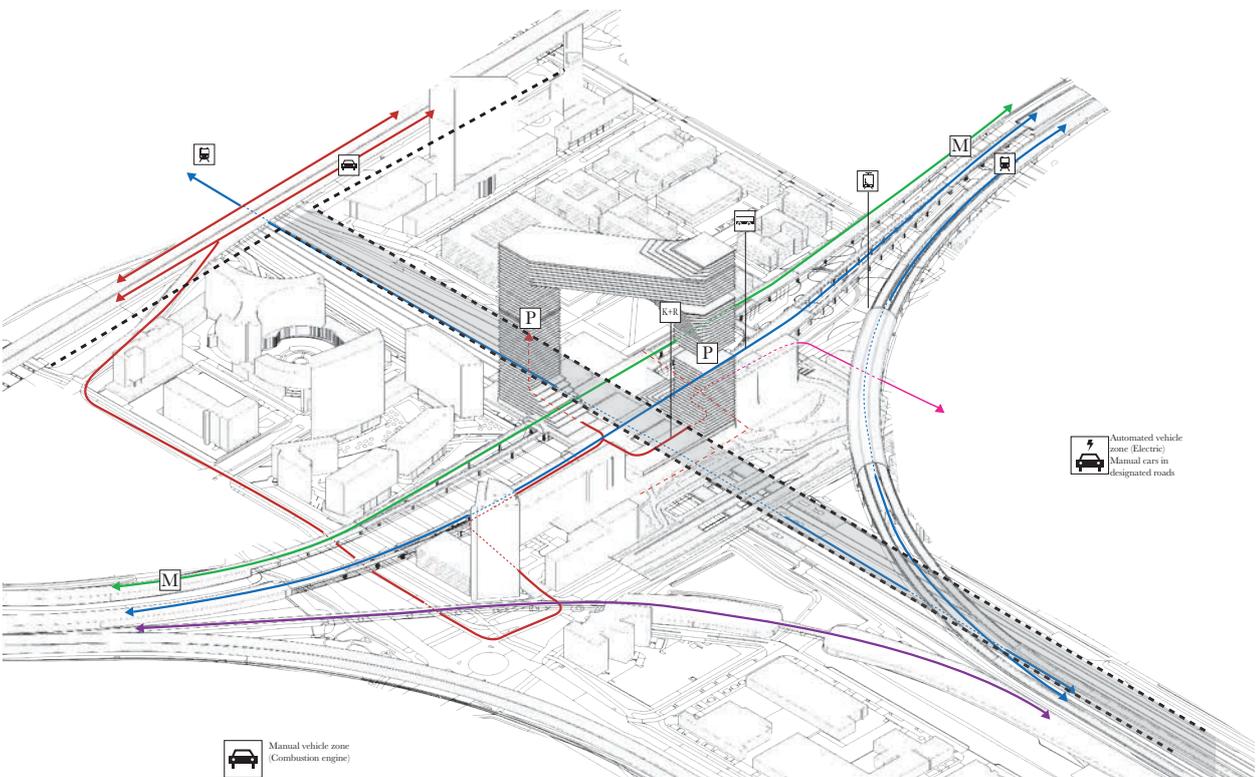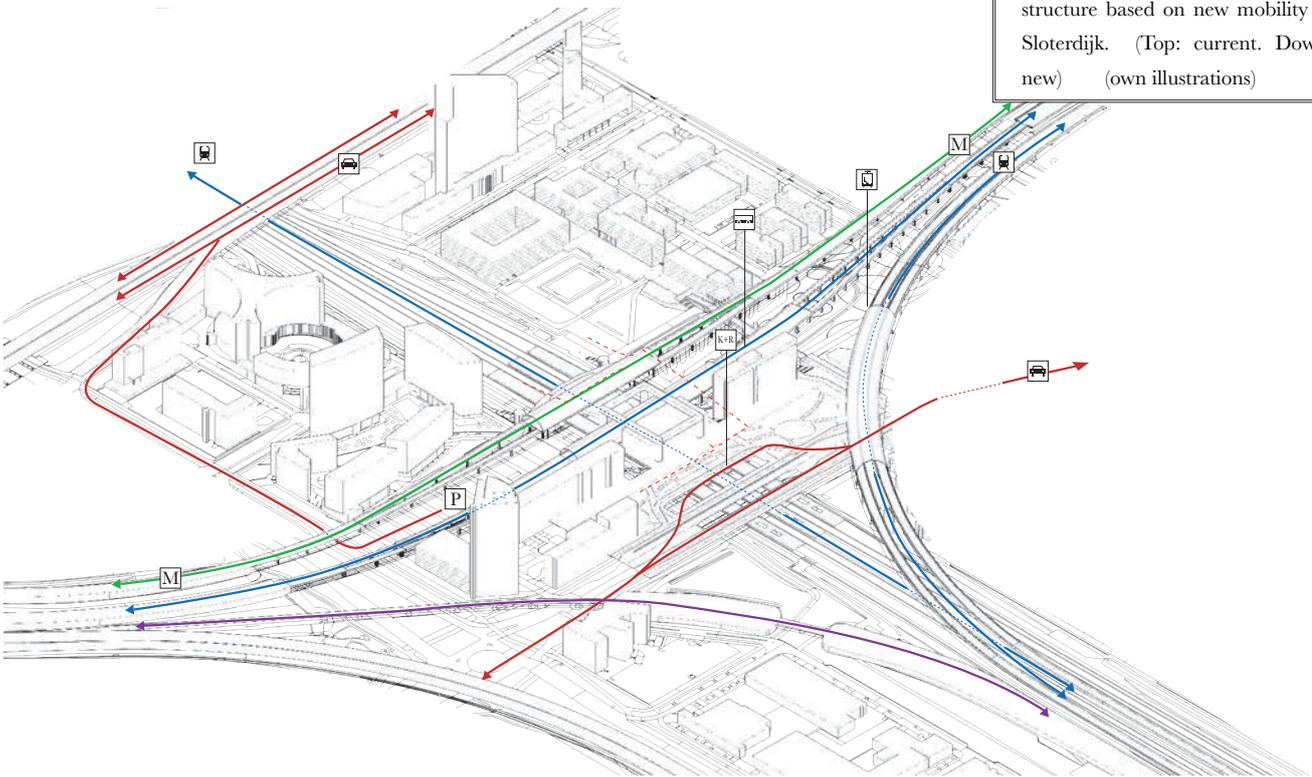

Theme 2: Experience + efficiency
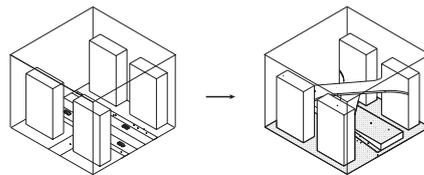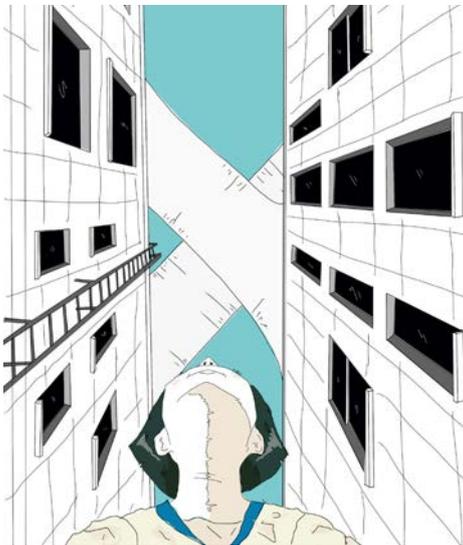
Theme 3: Well-being

Fig. 7: Investigating a new infrastructure based on new mobility in Sloterdijk. (Top: current. Down: new) (own illustrations)

Automated vehicle zone (Electric) Manual cars in designated roads

Manual vehicle zone (Combustion engine)

3. Elaboration on research method and approach chosen by the student in relation to the graduation studio methodical line of inquiry, reflecting thereby upon the scientific relevance of the work.

The chair of Cross Domain combines the freedom of elaborating on your fascinated-future-related topic with the theoretical framework. This is important because it allows, not only the student but also the reader to conceptualise the study in a broader context (i.e., the field of knowledge). These two aspects have to be taken into account when participating in the studio.

During the P0 and P1/2 presentations with several professors and students, the main critique of my project was how to apply a theoretical framework in this project. I realised this part of searching and applying the research became much more challenging than I expected it would be. During my whole education from VMBO until University, not much attention was given on applying several theories into a framework provided as a foundation for my research. During this education, I noticed that my visual representations are much more visible then my theoretical side. Therefore, I believe this studio gave me the excellent opportunity to discover the methodical line of inquiry. When getting more exposed to the methodological application in a project, I discovered that the intention of my project lies in contacting stakeholders, which became a relevant factor for my research. Therefore, to create a good foundation for my project, I interviewed architects (such as KRFT, Hoope Plevier architects, and UNStudio, data-specialists and specialists on self-driving cars like RADD. Therefore the research resulted in a more comprehensive and better-founded study.

During my study on AV's and Megastructures (like the works of Ron Herron), it became clear that many studies remain vague and unclear of its foundation. However, to determine the research method for this project, I determined my project based on the theory of John Creswell, who noticed the benefits of doing mixed-methods analysis, which can be seen as the combination of qualitative and quantitative research. By mixing the two methodologies permits a more complete and synergistic utilisation of data that is leading towards the optimal state of design. Therefore, Several interviews and the use of data has been implemented in my project in order to use these benefits of mixed-methods analysis.

Furthermore, with these aspects in mind, I used the method of Research by Design to summarise my process (Figure 8). The conclusions of the researches and collected data together with my brief (see step A, B and C in Fig 8), formed the input for my framework. The framework creates the foundation of determining the design during the P3 and P4 (shown in step D and E in Fig 8).

Conclusively, I saw the combination of research with design as a method as an initial struggle. Many reference projects like the earlier mentioned works of Herron does not show any founded outcomes and so, in my perspective, remains vague. However, I believe linking my project with an actual research method, made me understand its scientific relevance of my work — the relevance of understanding various issues and to find, gauge and seize future opportunities.
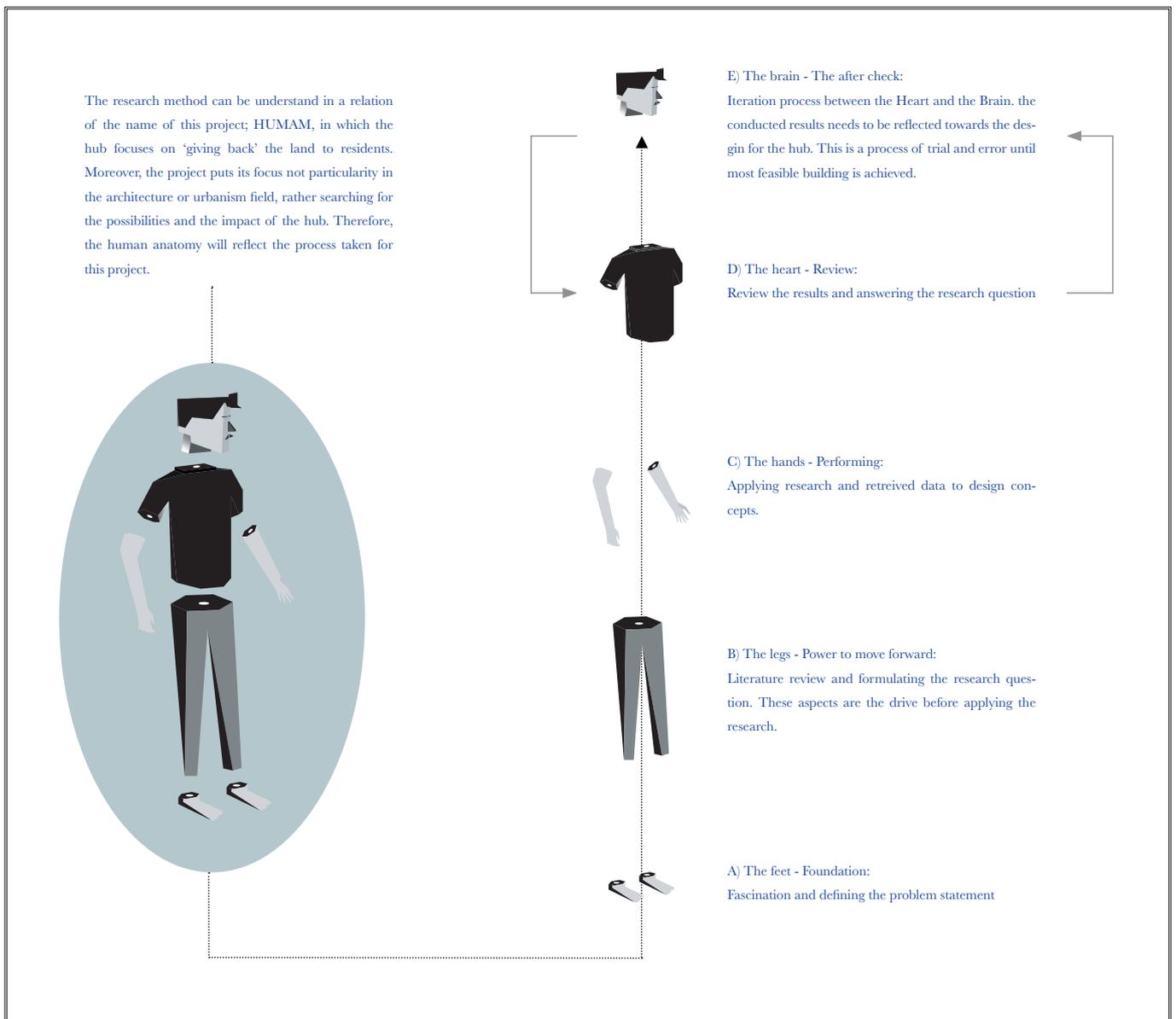
The research method can be understand in a relation of the name of this project; HUMAM, in which the hub focuses on 'giving back' the land to residents. Moreover, the project puts its focus not particularity in the architecture or urbanism field, rather searching for the possibilities and the impact of the hub. Therefore, the human anatomy will reflect the process taken for this project.

E) The brain - The after check:
Iteration process between the Heart and the Brain. the conducted results needs to be reflected towards the desgin for the hub. This is a process of trial and error until most feasible building is achieved.

D) The heart - Review:
Review the results and answering the research question

C) The hands - Performing:
Applying research and retreived data to design concepts.

B) The legs - Power to move forward:
Literature review and formulating the research question. These aspects are the drive before applying the research.

A) The feet - Foundation:
Fascination and defining the problem statement

Fig. 8: Illustrative scheme of applied research by design approach for this project (read from A > E) (own illustration)

4. The relationship between the graduation project and the wider social, professional and scientific framework.

Although the studio of Cross Domain is an architectural studio, I discovered that the architectural input results into the impact of a building in our society. My design of a transportation hub for the city could be seen as 'just' one building among others. However, I noticed that this phenomenon could change the urban environment on a wide-scale. With that in mind, I became fascinated by the results a hub could give; no cars, more green, cleaner air, higher density, more freedom on the infrastructural level and so on. The social tasks do not only live up to great political decisions; architects always tend to find a redefinition of optimisation for our growing society continually. Therefore, the theme of the studio together with my fascination with having new technological developments can result in a wider social foundation for Sloterdijk.

However, in the exploration on how to get rid of the car and live car-free or by Self-driving car, I also noticed the ethical side of the story; privacy. The car can be seen as private ownership. If that will be taken away, it might also lead to more social issues which could not be solved on an architectural level but more political. Despite this, I believe in thinking of social well-being can also be seen as an essential factor to reconsider the car in the area. People often misunderstand the fact of how many traffic accidents occur in the world. Everyone in our near environment is familiar or was involved in a car accident with physical, mental injury or death. In my perspective, traffic accidents in our society are more or less 'accepted'. Figure 9 shows a rough calculation how much space we will save if we want to ban the car in a certain area. We have accepted that there were six hundred deaths and thousands of injuries in the Netherlands each year. What number of injuries do we 'accept' for car accidents? Technology-wise, our world is changing, and this also reflects our social life; we are more productive and want to get things done quicker and more efficient. With the rise of smart, innovative technologies, it will lead to a breakthrough of mobility where the autonomous car is leading the future of opportunities.

I believe freedom is also the freedom to move you safely. However, to ensure the safety of our society and to host the highly increased number of residents, there must be a reliable solution to address these issues. Therefore, I believe that my project gave me the ultimate opportunity to set my fascination as an aspired architect in motion. Not only in a constructive way, but also societal on a larger scale that shows that the impact of one building can optimise the whole area; living surrounded by green infrastructure, more freedom to travel, and to reach a higher density while maintaining the urban quality.

Fig. 9: Rough calculation on parking place expected in 2050 if we do not ban the car. Each small white block represents 1 parking spot; less space for society as a result. (own illustration)
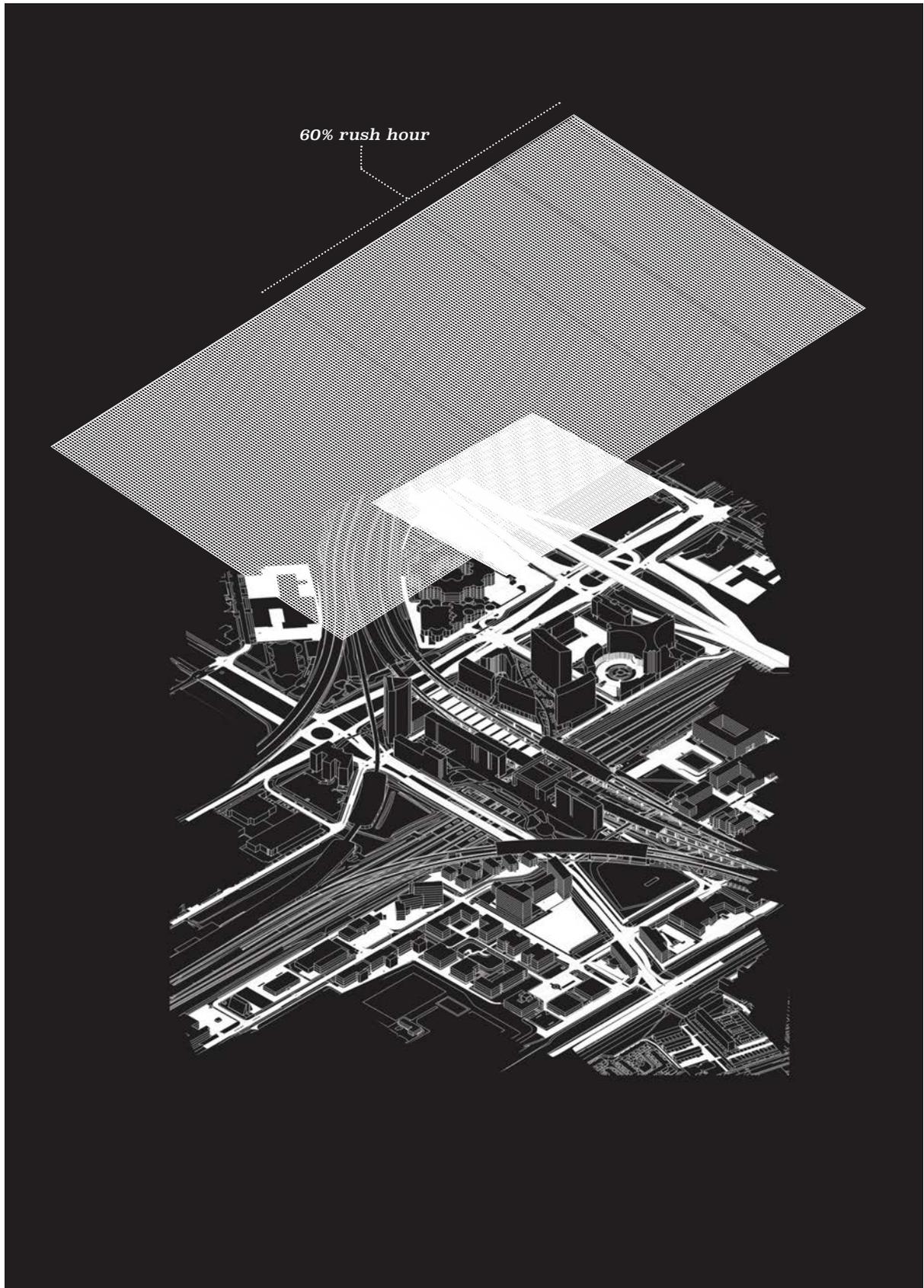
60% rush hour

5. Discuss the ethical issues and dilemmas you may have encountered in (i) doing the research, (ii, if applicable) elaborating the design and (iii) potential applications of the results in practice.

The ethical issues and dilemmas I noticed during my research project was during the design phase after P2 period. After getting the interviews from different stakeholders, It became clear that having a hub with self-driving cars could solve the whole issue of road congestion and the enormous amount of parking space. However, the ethical issue I was facing relies on the safety of our society. Ethical issues can be seen as quite ubiquitous. If the municipality embraces the idea of having self-driving cars, decisions made by architects or data-technicians today will determine not how just one car should drive, but how the whole road network should behave. In other words; algorithms become the policy.

However, what I learned during this studio is not only working towards a feasible building. While working with Gabriel from Geomatics, I experienced how architects can contribute big data in design. It gave me the opportunity to explore and meet these possibilities. I noticed that the ethical dilemma of this projects both shows advantages as well as disadvantages. By also looking at the advantages of technology and design, which is shown in figure 10 (car embraced by society), the building is using a clever way of integrating both parking and living. When talking with other people about this idea, I noticed that there is some controversy about this proposal. However, for me as aspiring architect, it is not about the actual implementation, but more about opening new opportunities and redefining architectural context, such as living + parking.

On the contrary, I also found the downside of technology in our society. If the car is also able to take the miseries of human behaviour, I believe the car should instead not look at how people live and how they drive the car. We (humans) are terrible drivers. However, by taking away what we can not do, driving a car, does not mean the computer should take over. I noticed that by taking away one problem, another problem would arise and therefore will stay in this infinite loop of trying to solve what is there, which cannot be solved at all.

This research became very interesting to me, something I have never experienced or researched before. Through recognizing how architecture could play a role in this ethical notion, I believe it is a matter of time how we as architects should act in the world of future technology. A world where architecture provides us more freedom, and more opportunities (figure 11). To conclude, I believe we should always preserve and nurture the profession of Architecture. It is the understanding of how we will design and shape our future.
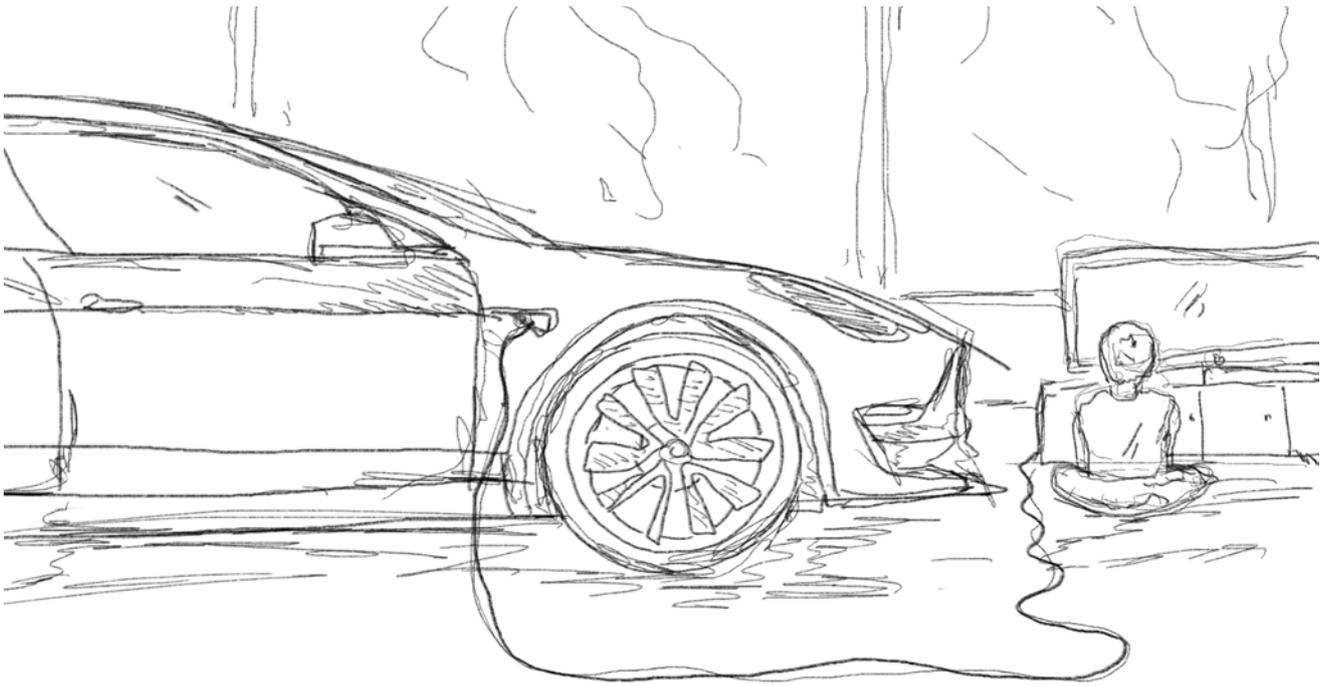
Fig. 10: Cars embraced by society as for example, an energy source.
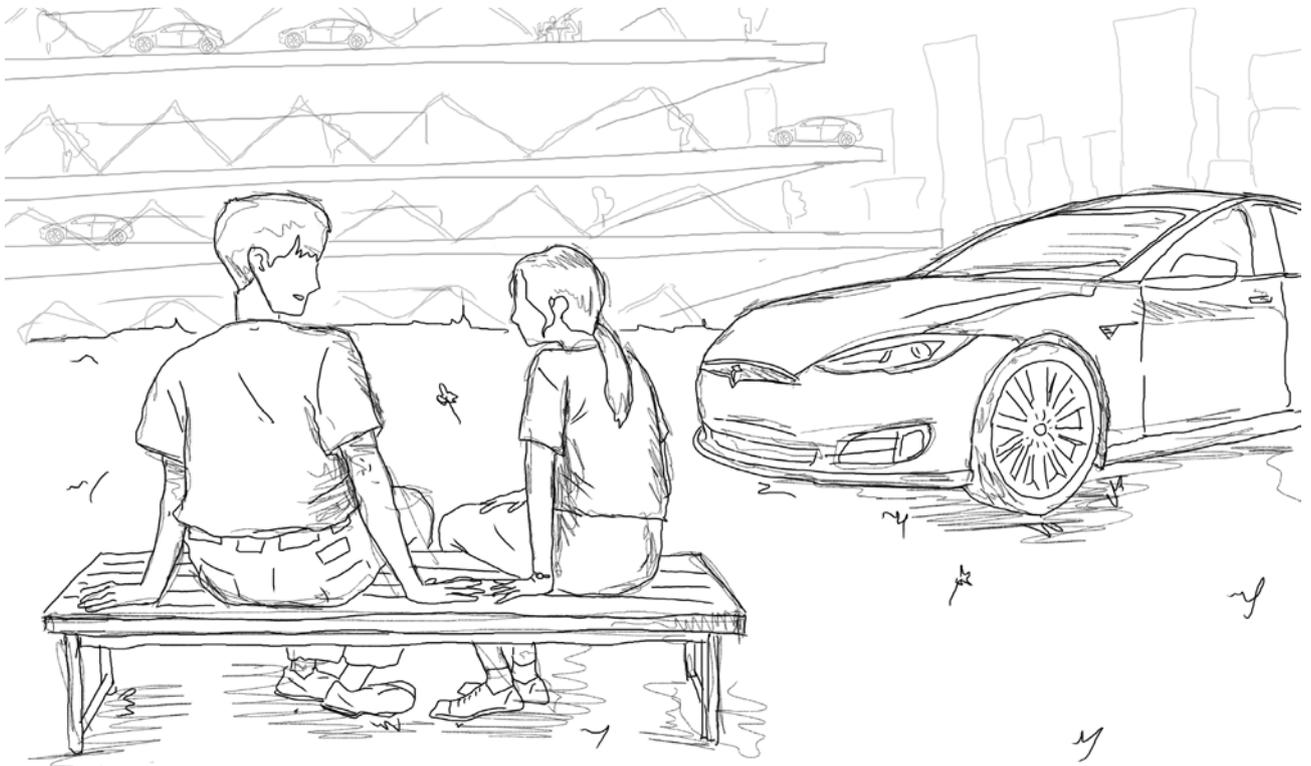(own illustration)

Fig. 11: The possibilities of car-free area, resulting in higher density and freedom for the people of Sloterdijk. (own illustration)