

Graduation Plan

Sebastiaan Brouwer
4277414



Personal Information.

<i>Name</i>	Sebastiaan Brouwer
<i>Student number</i>	4277414
<i>Adress</i>	
<i>Postal code</i>	
<i>Place of residence</i>	
<i>Telephone number</i>	
<i>E-mail adress</i>	
<i>Personal e-mail adress</i>	S.M.Brouwer@student.tudelft.nl

Graduation studio.

<i>Name of studio</i>	Architectural Engineering
<i>Graduation assignment</i>	Second Life
<i>Design location</i>	Bruggebouw Oost, Grotiusplaats, the Hague
<i>Architecture teacher</i>	Annebregje Snijders
<i>Research teacher</i>	Jos de Krieger
<i>Building Technology teacher</i>	Paddy Tomesen

Studio motivation.

The world is a constant changing organism and so is the world of the Built Environment. In my opinion the architect needs to have his or her tool set and technical research methods besides his or her creative expression alone. Knowledge about the environment and the incorporation of circular economy design became more a must than a pre.

Architectural Engineering focuses on integrated design solutions in which energy transition, circularity and healthy living environments form the handle towards a better world. That perspective really fits the attitude as how I am as a person.

Design location

Eastern Bridge Building (Bruggebouw Oost), The Hague

Graduation project keywords

Last-mile food distribution
Urban mobility
Online grocery shopping
Food supply chain

Climate plan.

In April 2011, the municipality of The Hague formed its climate plan. In this plan, the city of Hague showed their approach to reach the goals of the Paris agreement and elaborated their timeframe.

The goal is to lower the CO₂ levels to 350-450 ppm. Only then, they stated, are the consequences of Climate Change controllable and could we [as humans] adapt us from these changes.

In 2030 the city must be fully climate neutral.

Problem statement.

Urban mobility.

The Hague is, with 6,429 inhabitants per square kilometer, the densest city in the Netherlands. Besides, it struggles with the most traffic congestion as well. Nowhere in the G4 cities, you lose as much time in traffic jams than in this city.¹ The amount of traffic is only increasing. A report of the mobility transition of the “Dienst Stedelijke Ontwikkeling afdeling Mobiliteit” stated with an unchanged policy the number of traffic jams will increase exponentially.

Food supply chain.

Within the food supply chain, things are changing. When you walk in the supermarket, order something online or go to a fancy restaurant in the city center, you normally don't think about where your food comes from, how it's produced or how long it has been on its way.

The food supply chain is a very complex matter with many actors, stakeholders and movements. However, through an increase in welfare, awareness and the beginning of the Digital Era the food supply chain is changing. And it's changing rapidly.

Due to welfare people are eating more and more out of their house. Due to our busy lives we order more. And, we start ordering our groceries more and more online. It's now taking up 6% of the market but in the last two years, this sector increased by 30% each year. Three trends that puts more pressure on our mobility. An increase of goods that need to be transported. The city center has the highest density of people and also has the highest density of restaurants. However, this part also has the highest level of congestion. So, what will this trend do with our built environment and how can we approach this upcoming problem and solve it with a spatial design?

Climate impact.

The city of The Hague strives to be climate neutral in 2030. But with this current trend, it is going to be difficult. More food needs to be dispersed in the city, more people are going to live, work and visit the Hague, more traffic needs to go in the city center. All aspects that put more pressure on the Climate Goals.

Objective.

Following from the problem statement contrived above, the design objective of the graduation project is to develop a research-based (new) urban food facility that responds to the future food supply trends and meets the climate goals of The Hague of 2030. Furthermore, it will develop a design that reacts on and helps with reaching the climate goals of the municipality of The Hague for 2030 regarding three aspects:

Food

The design has the goal to improve the current food supply chain and reacts on the trends. What does the inhabitant, visitor or worker of future the Hague needs or how could we change their wishes to reach the goals of 2030?

Urban mobility

The objective is to have an urban impact with spatial design. How could we design and use this facility to lower the pressure of the roads? Leading to lesser congestion, lesser waiting time and lesser greenhouse gases in the air.

Grotiusplaats

The Haagse Loper will go through this region, a connecting part of the infrastructure that will give the people a pedestrian route from the city center, via The Hague Central Station, to the Beatrixkwartier. How could the new design contribute to social cohesion, flexibility, public domains and leisure within the city?

Design Question.

How can the Bruggebouw in The Hague be redesigned to respond to the change of the food supply chain and the urban mobility and at the same time optimize its interaction with the Grotiusplaats?

Research Question.

Which (new) typologies and functions are needed to facilitate the new trend of the food supply chain that meets the climate goals of the Hague of 2030?

Subquestions.

1. How did the food supply chain and its last mile distribution develop in the past 50 years?
 2. What are the current trends within the food supply chain and its last mile distribution?
 3. What are the spatial effects of this trend on the urban context?
 4. Which flows will change from the spatial effects [mobility, energy, warmth and organics] of this trend?
 5. Which challenges and opportunities will lead from these changes of flows?
 6. Which (new) functions and typologies could be used/combined that respond to the new situation in relation with the climate goals of 2030?
-

Methodology.

My research will differ and are catered to three different methods: literature study, flow analysis and research by design.

My research started with a literature study on the historical development of the last-mile within the food industry and the projections towards the future.

This resulted in a baseline of 2019 and a projection of 2030. The paper took that data to calculate the flows of urban mobility, covered kilometers, energy and grocery flows for 2019 and 2030.

This resulted in a program of requirement for the building and the energy demand of those functions within the building. From a research by design perspective, the paper tried to set a framework to coop with the context.

Literature.

"Aantal Elektrische Auto's In Nederland In Jaar Tijd Verdubbeld". 2019. Nos.Nl. <https://nos.nl/artikel/2283914-aantal-elektrische-auto-s-in-nederland-in-jaar-tijd-verdubbeld.html>.

Adviseurs mobiliteit Goudappel Coffeng. (2018). Verkeersmodel MRDH 2.0. Deventer.

"Den Haag In Cijfers". 2019. Denhaag.Incijfers.Nl. <https://denhaag.incijfers.nl/>.

"Deze Boodschappen Werden Het Afgelopen Jaar Het Meest Bezorgd In Den Haag - Indebuurt Den Haag". 2019. Indebuurt Den Haag. <https://indebuurt.nl/den Haag/>
Steel, C. (2013). *Hungry city*. London: Vintage Books.

"Distributiecentrum Van De Toekomst: Extreem Duurzaam En Modulair". 2019. Logistiek. <https://www.logistiek.nl/warehousing/artikel/2019>

Foodserve Instituut Nederland. 2019. "Food Strategy". Bennekom

"Gemeente Dashboard - Rijswijk In Cijfers - Statistieken - Gegevens - Dashboards – Data". 2019. Rijswijk.Incijfers.Nl. <http://rijswijk.incijfers.nl/>.

"Hoeveel CO2 Stoot Een Gemiddelde Benzine Personenauto Per Jaar Uit? | Coöperatief Dutch Renewery -". 2019. Dutchrenewery.Nl. <https://dutchrenewery.nl/ufaqs/hoeveel-co2-stoot-een-gemiddelde-benzine-personenauto-per-jaar-uit/>.

Hogeschool Den Bosch. 1987. "Leergang Ontwerpen Voor Koudetechniek". C - Bruto Momenteel Koelvermogen Van Een Gekoelde Ruimte. Zeist: P.C. Noordervliet.

Hogeschool Den Bosch. 1987. "Leergang Ontwerpen Voor Koudetechniek". B - Circulatievoud. Zeist: P.C. Noordervliet.

Kaur, Jasmeet, and Anju Bala. 2019. "A Hybrid Energy Management Approach For Home Appliances Using Climatic Forecasting". *Building Simulation* 12 (6): 1033-1045. doi:10.1007/s12273-019-0552-2.

Kummu, M., de Moel, H., Ward, P., & Varis, O. (2011). How Close Do We Live to Water? A Global Analysis of Population Distance to Freshwater Bodies. *Plos ONE*, 6(6), e20578. doi: 10.1371/journal.pone.0020578

"Leidschendam-Voorburg In Cijfers Wijkatlas". 2019. Leidschendam-Voorburg.Incijfers.Nl. <https://leidschendam-voorburg.incijfers.nl>.

Ministerie van Economische Zaken. 2013. "Opbrengst Van Zonnestroom In Nederland". Den Haag.

Ministerie van Infrastructuur en Milieu. (2012). *Verkeerskundige analyse met het Haaglandenmodel*. Den Haag.

Muller, Michiel. 2017. "Picnic At The NOAH17 London". Presentation, London, , 2017.

"Online Supermarkt Picnic Snelst Groeiende Bedrijf Van Nederland". 2019. RTLZ. <https://www.rtlz.nl/business/ondernemen/artikel/4649356/online-supermarkt-picnic-snelst-groeiende-bedrijf-van-nederland>.

RIVM. 2019. "Voedingsmiddelengroepen Globodiet-Indeling."

Stichting Voedingcentrum Nederland. 2019. "Voedselverspilling Bij Huishoudens In Nederland In 2019". Den Haag.

Steel, C. (2013). *Hungry city*. London: Vintage Books.

"Supermarkten En Doe-Het-Zelf-Branche Rukken Op In Online Top-100". 2019. Nos. Nl. <https://nos.nl/artikel/2302368-supermarkten-en-doe-het-zelf-branche-rukken-op-in-online-top-100.html>.

TNO. 2019. "Energie- En Milieuaspecten Van Elektrische Personenvoertuigen". Delft: TNO.

Veenstra, Sander. 2008. "Verkeerspatronen Rond Supermarkten." p.80

Verwaaijen, Jeroen, Milan Caspers, and Jeroen van der Weerd. 2019. "Emerce.Nl". Emerce.Nl. <https://www.emerce.nl/research/91-retailomzet-fysiek-9-online>.

voedingcentrum.nl. 2019. "Factsheet - Syntheserapport Voedselverspilling In Nederlandse Huishoudens 2019."

"Voedselconsumptiepeiling | Voedselconsumptiepeiling". 2019. Wateetnederland.Nl. <http://www.wateetnederland.nl/resultaten/voedingsmiddelen/plaats>.

"Wat Is Je CO2-Voetafdruk?". 2019. Milieucentraal.Nl. <https://www.milieucentraal.nl/klimaat-en-aarde/klimaatklappers/wat-is-je-co2-voetafdruk/>.

Wiskerke, Johannes S. C., Saline Verhoeven, and Jacques Abelman. 2018. *Flourishing Foodscapes*. Amsterdam: Academy of Architecture.

Planning.

