reflection

While now Almere is a shining example of a sub-urban city, consisting of widely spread dwelling-only areas, it wants to radically break with this tradition with its new developments. The proposed Pampus extension, which is projected on the west side of the existing town, holds the ambition to connect Almere to the Randstad area; but not only geographically. Pampus has to become a high density urban environment, with a dense mixture of dwellings, offices, culture, education and shops.

With the choice for a real urban environment, Almere joins a larger movement which favors the densification of cities. But while this simply implies an increase in building height for private buildings like dwellings and offices, one might wonder how densification affects public functions and space.

While many programs only function part-time, they occupy valuable city space 24/7. Considered from a densification ideal it is no longer valid to reserve area within the city that is only used occasionally.

I interpreted the studio’s program, an intermodal transferium, as a central place that functions as hub between the surroundings and the different means of transport, and extended the program with a market place and an open-air theater.

The projected location of the hub, on top of an underground station of the new metro connecting Amsterdam to Almere, is presented in the urban master plan as a zone that is purposely left undefined and that will be subjected to differentiation and densification only in the long term.

Within this urban context I discerned three types of change affecting the project:

Long term: the master plan intentionally doesn’t define the direct surroundings of the plan area to leave it open for differentiation and densification in the long term.

Short term: the project is located within a high density urban environment. Space is scarce. Public space should be able to host different functions in shifting configurations.

24/7 - Real time: Numbers and type of users are in a continuous flux. Different usage patterns demand different spatial conditions.

To prevent the resulting architectural solution for this complex situation to be a static compromise between averaged or predicted demands and constraints, I intended a solution that is capable of optimizing its configuration according actual demands and constraints.

I defined three aspects of the design to be optimized:

Space occupation. How can different functions share space in such a way the total area needed is smaller than the sum of their individual spatial demands?

Connectivity. How can different functions be positioned in such a way the connections between the direct surroundings and among the functions themselves are fit to the current situation?

Architectural space. How can space be adapted to the number of users and the corresponding usage patterns.
In accordance with the studio’s methodical line of approach, I didn’t conceive the design as a fixed composition but as a field defined by local interconnectivity, in such a way the overall form is the result of conditions established locally. The design task lay therefore in describing the internal relations of the hubs functions parametrically, as well the relations among the functions themselves and their relation with the urban environment. My research focused on how to embed these relations in an interactive architectural model. Also, I looked into adaptable surfaces to conduct design rules that I used to design an adaptable surface fit for this project.

This resulted in parametric architectural models embedded in a multi-agent simulation tool that is used to render architectural configurations on an adaptable surface which are based on the current urban context. The place is made up out of hexagonal blocks that can move up and down and thus is able to physically mirror the simulation’s outcome. The adaptable surface is connected to a static subterranean infrastructure at locations that can be considered as framework around which the reconfigurations take place. The subterranean structure hosts the inevitably static elements of the program (metro, parking) while it is able to change its outer boundary to adapt to long-term changes, without interrupting its operation logic.

My research on swarm behavior paid off on different levels of this project. It is used in the tool to distribute the input data among the program’s functions interactively. Secondly, the functions act as swarm and organize themselves according to the data they receive, obeying a set of rules to ensure practical solutions. But swarm logic also enables the hexagonal blocks to adapt real-time to changing user streams by sensing their environment, being both users and their neighboring blocks, and acting accordingly.

To summarize, by defining the relations between architectural components parametrically and using swarm logic to process data, I have been able to develop a tool that can render architectural configurations that are fit to actual demands and constraints on an reconfigurable physical structure. This combination of tool and structure is able to deal with long term, short term as well as real time changes that follow from the urban context.