

# Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



## Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners ([Examencommissie-BK@tudelft.nl](mailto:Examencommissie-BK@tudelft.nl)), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information		
Name	Mark Caruana	
Student number	6071856	
Studio		
Name / Theme	AR3DC100 Architectural Design Crossovers Graduation Studio	
Main mentor	Roberto Cavallo	Architectural Design (Architectural Design Crossovers)
Second mentor	Florian Eckardt	Technical Building Design
Third mentor	Alper S. Alkan	Architectural Research (Architectural Design Crossovers)
Argumentation of choice of the studio	My choice for this graduation studio was influenced by the fact that it is research-based and because it gave me the freedom to choose whatever topic of research or fascination I wished to pursue, while still having a studio framework and a given site-city which could guide me in formulating that topic. I was also interested in the studio because of its interdisciplinary approach and the systems-based thinking that it promotes.	
Graduation project		
Title of the graduation project	The Metabolic Periphery <i>Towards socially, economically and ecologically productive operational landscapes in the periphery of Madrid</i>	
Goal		
Location:	Madrid, Spain	
The posed problem,	Cities are reliant on unseen 'operational landscapes' – these are places of extraction, production and disposal, which are typically located in the global, territorial and urban periphery. Peripheral operational landscapes perform an unequal social, economic and ecological exchange with urban centers of accumulation, with those living in proximity to operation typically	

	<p>bearing the brunt of their negative effects. In Madrid this urban-operational relationship is evident as contaminating industries have been organized towards the south, downstream of the Manzanares river, along with disadvantaged communities. The continued redefinition of the urban and operational relationship through the factors of proximity, segregation and relocation, not only created entrenched social, economic and ecological inequalities, but it also produced a wasteful and sprawling urbanization that continues to create drosscapes, a term coined by Alan Berger, which describes wasteful and wasting areas.</p>
research questions and	<p><b>Main</b>  What if the existing metabolic processes of supply, production and disposal in Madrid's periphery could be rethought, and a socially, economically and ecologically productive process could be instated for peripheral communities?</p> <p><b>Sub</b>  _What communities are most negatively affected by unequal metabolic exchanges in Madrid?  _How has Madrid's urban metabolism shaped the urban development of its periphery, both historically and contemporaneously?  _How can operative landscapes become socially, economically and ecologically productive?  _What strategies may be implemented to 'scape' (metaphorically resurface) the dross (wasteful and wasting zones) to prevent further wasteful practices?  _What sites of intervention could offer the possibility to interface the urban and the operational?</p>
design assignment in which these result.	<p>The outcome of the research involves the identification of an operational territory where the relationship between the urban and the operational spheres has been historically redefined, and</p>

	<p>where the production of urban drosscapes through the city's growth is evident.</p> <p>Following the identification of this territory, sites will be identified which may act as nodes within a network I will design which will define a new urban-operational ecology for the city. The aim of this network will be to mitigate the wasteful effects of the city's urban growth and to begin a repair of the existing drosscapes.</p> <p>Once a design of the network is accomplished, one of multiple nodes within the network may be further elaborated into a design proposal. The aim of the proposal will be to act as an interface between the urban and the operational spheres, and to become a launchpad which may generate this new network within the city.</p>
<p>[This should be formulated in such a way that the graduation project can answer these questions. The definition of the problem has to be significant to a clearly defined area of research and design.]</p>	
<b>Process</b>	
<b>Method description</b>	
<p><b>Historical Research</b></p> <ul style="list-style-type: none"> <li>• Objective: To trace the evolution of Madrid's urban fabric and its operational landscapes, focusing on how their relationship has been redefined over time.</li> <li>• Approach: Studying historical maps, archival documents, and literature to understand patterns of urban growth, infrastructure development, and shifts in the urban-operational dynamic.</li> </ul> <p><b>Mapping</b></p> <ul style="list-style-type: none"> <li>• Objective: To visually and spatially analyze the interplay between operational landscapes, urban growth, and socio-economic conditions in Madrid.</li> <li>• Approach: <ul style="list-style-type: none"> <li>○ Operational Landscapes: Mapping the spatial implications of industries and their supporting infrastructures.</li> <li>○ Socio-economic Conditions: Analyzing demographic, income, and economic activity data in relation to the city's geography.</li> </ul> </li> </ul>	

- Drosscapes: Identifying and mapping wasteful and wasting urban landscapes.

### **Site Catalogue and Analysis**

- Objective: Identifying and evaluating potential sites for intervention, ensuring a systematic understanding of their characteristics and constraints.
- Approach:
  - Comparative analysis of selected sites based on criteria such as degree of urbanity and operation, and the presence of network infrastructure.
  - Identifying site-specific design constraints and opportunities to inform the architectural intervention.

### **Case Study Analysis**

- Objective: To derive insights from built or proposed projects tackling similar issues on both the urban and architectural scale.
- Approach:
  - Analyzing built projects, speculative designs, or theoretical precedents to inform design strategies.

## Literature and general practical references

### Primary Sources

Berger, A. M. (2006). *Drosscape: Wasting Land in Urban America*. Princeton: Princeton Architectural Press.

Bunker, S. G. (1985). *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*. Chicago: University of Chicago Press.

Hutton, J. (2019). *Reciprocal Landscapes: Stories of Material Movement*. Routledge.

Ibañez, D., & Katsikis, N. (2014). Grounding Metabolism Editorial. In D. Ibañez, & N. Katsikis, *New Geographies 06: Grounding Metabolism* (pp. 2-9). Cambridge: Harvard University Press.

Liboiron, M., & Lepawsky, J. (2022). *Discard Studies: Wasting, Systems, and Power*. The MIT Press.

Moe, K. (2021). *Unless: The Seagram Building Construction Ecology*. Actar Publishers.

Moore, J. W. (2015). *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. Verso Books.

### Secondary Sources

Club de Debates Urbanos. (2018, February). Por el Reequilibrio Territorial en Los Distritos del Sur Madrileño. Retrieved from <https://clubdebatesurbanos.org/por-el-reequilibrio-territorial-en-los-distritos-del-sur-madrileno/>

Moe, K. (2022, June 3). The Berlage Sessions: "On Ecology" by Kiel Moe. (Berlage, Interviewer)

### Practical References

Tillie, Nico & O.Klijn, & E., Frijters & Borsboom, Judith & M., Looije & Sijmons, Dirk. (2014). *Urban Metabolism, sustainable development in Rotterdam*.

DELVA Landscape Architects, Studioninedots, Metabolic. (2019). *Circular Cities: Designing Post-Industrial Amsterdam – the case of Buiksloterham*.

City of the Future. (2021, December 10). Episode 19: Next-Gen Manufacturing.

Space&Matter. (2023). *Sample: Adding a social dimension to a circular district*. Retrieved from spaceandmatter.nl: <https://www.spaceandmatter.nl/work/sample>

## Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

This graduation project proposes an architecture project grounded in urban analysis, operating and the intersection of both realms. By grounding the research in an understanding of urban metabolism and operational landscapes, the project addresses critical technical issues tied to wasteful urbanism. This approach implements systems thinking while integrating technical, social and spatial dimensions of architecture. The project bridges architectural design with broader urban processes, offering a multidimensional response to the challenges of contemporary urban growth.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

My work addresses significant socio-economic inequalities in the peripheries of cities, exploring how an architectural intervention can contribute to more equitable and productive urban peripheries. By rethinking the metabolic processes in urban peripheries, the project proposes strategies to transform overlooked areas in the city into sites of synergy and exchange. This aligns with contemporary professional discourse on integrating diverse urban functions and fostering sustainable growth. Additionally, the theoretical framework situates the work within the broader scientific inquiry into urban metabolism and the dynamics of city-hinterland relationships, contributing to critical conversations on urbanization, resource flows, and territorial equity.