PROJECT

Amsterdam Sloterdijk Station: potentials and limitations of the infrastructure (Sebastiaan van Damme)

Role of Stations

Exploring the role of stations in future metropolitan areas

Paris (France); Amsterdam and Rotterdam (The Netherlands)

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TYPE OF PROJECT Special Project

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LOCATIONS Paris (France); Amsterdam and Rotterdam (The Netherlands)

KEYWORDS Rail-metro stations, Urban transformation, Intermodality, Public space, Architecture and urban design

INTRODUCTION

Randstad and Grand Paris

Role of Stations focuses on the various roles of railway stations in the development and transformation of their surrounding urban and metropolitan areas. The main pillar of the project is the study of two rapidly developing metropolitan contexts: the 'Randstad' in the Netherlands and the 'Grand Paris' in France, where rail-metro stations are considered key elements in organising intermodal transport, acting as catalysts for urban development. In the field of public transport, both countries are developing large infrastructure projects.

The Netherlands has recently renovated its larger railway stations to accommodate the ever-growing flow of commuters and tourists. The so-called National Key Projects – Rotterdam, Arnhem, Breda, The Hague, Utrecht, and Amsterdam Zuid stations – all function as important hubs, as the Dutch railways serve an estimated 1 million travellers a day. France, on the other hand, is now deeply involved in an ambitious automatic transport network project, called 'Grand Paris Express', with the aim to build 68 railway stations and laying down 200 km of railway. By 2030, more than 95% of the Ile de France region's residents will live no more than 2 km away from a railway station.

Redefining railway stations

The main challenge addressed by the project was to identify new roles for railway stations that would go beyond their mobility (node) function on the network scale and to investigate their place and social values on the urban and architectural scale, becoming catalysts for new urban developments. To achieve this research scope, the project required collaboration with several stakeholders and experts from various fields.

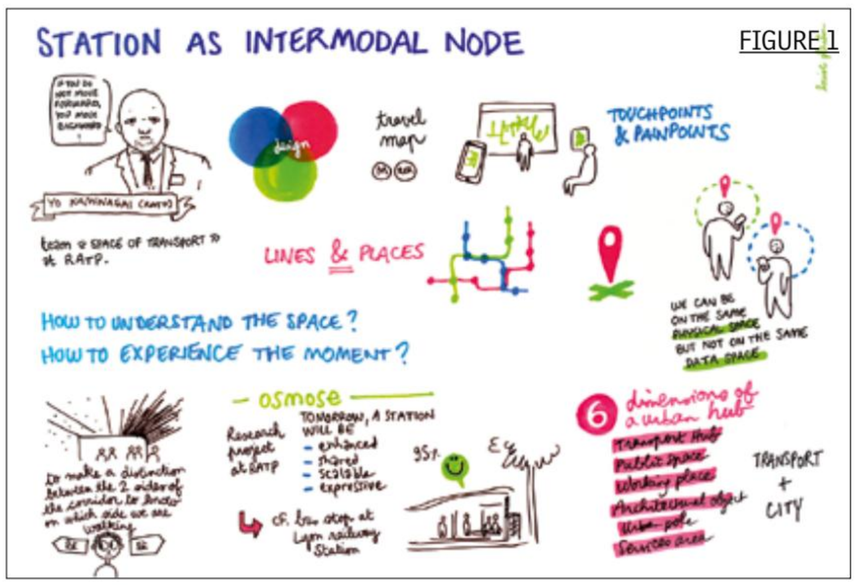
The ambition of the Role of Stations project was to learn from other design practices and research approaches on station design and station area development in distinct geographical contexts, while addressing comparable mobility challenges on the levels of inner city, suburban, and peripheral areas. The knowledge gathered during the course of the project serves as the foundation for design and research explorations regarding the various station-city interplays in current and future metropolitan areas.

The process

The core approach of the Role of Stations project was to engage both academics (researchers and students) and practitioners (designers and stakeholders) in the research process through several activities.

FIGURE 2

Station as Intermodal Node (figure 1) and Stations of the future (figure 2) (Louise Plantin, source: visual note made during the workshops at the 'Gares du Futur/Stations of the Future' event in March 2018)

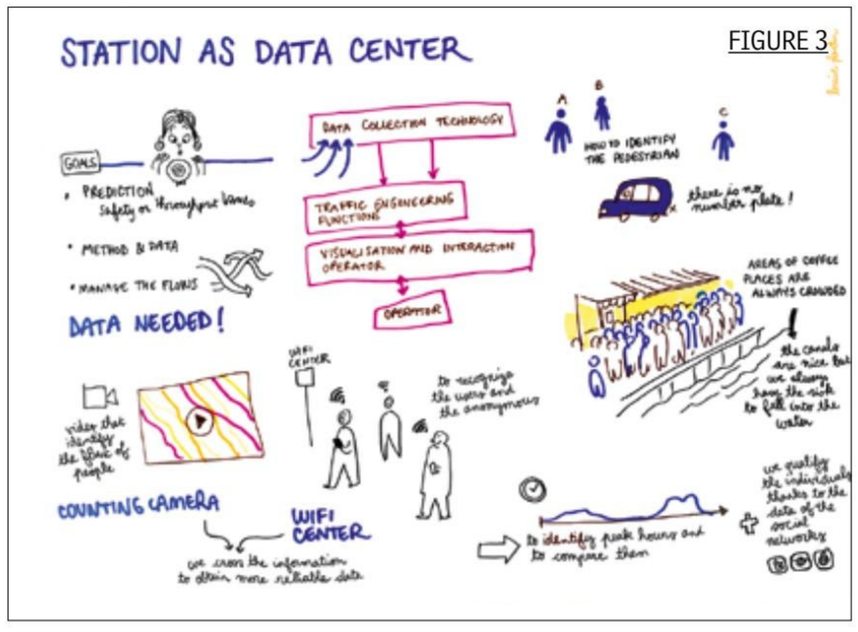


PARTICIPANTS Prorail; NS Stations, Bureau Spoorbouwmeester, AREP, RATP, GVB, University of Antwerp, Fabrique du Métro, Société du Grand Paris, Fabrique, Movares, Rhônexpress, ENSA Paris-La Villette, International Union of Railways (UIC), SNCF Gares & Connexions, UNStudio, Benthem Crouwel, Provincie Noord-Holland, Delta Metropool Association, Royal Haskoning, SWECO, IFSTTAR, ARTELIA Ville & Transport, GVB, Vinci Construction, La Fabrique de la Cité, APUR, Sensual City Studio, Atelier Novembre, ILEX Paysage Urbanisme, KCAP, Mecanoo, PosadMaxwan, VenhoevenCS, KAAN Architects, Municipality of Maastricht, BNA Onderzoek

Three main types of activities are highlighted here: one Dutch-French debate with academics and professionals on best practices and research projects on stations (Stations of the Future/Gares du Futur), two one-week international summer schools with students focusing on a real case in Amsterdam (Sloterdijk Station and Havenstad) and MSc design courses at TU Delft in Architecture and Urban Design dealing with several suburban stations in Rotterdam.

The project kicked off during the *'Stations of the Future/Gares du Futur'* event in March 2018, which was organised in Paris on behalf of AMS and DIMI, with the collaboration of the Innovation Section and the Economic Cluster of the Dutch Embassy in Paris, Atelier Néerlandais, and the think tank institute La Fabrique de la Cité. The embassy had proposed bringing together experts involved in the infrastructure projects from the Netherlands and Ile de France to exchange know-how and expertise. Together with Dutch and French planning authorities, mass transit operators, railway companies, station projects designers, and researchers, the event focused on case studies from both metropolitan areas to understand the role of stations as public transport and urban nodes. During this joint workshop, topics such as 'Station as Intermodal Node' (SaN), 'Station as Destination' (SaD) and 'Station as Data Center' (SaC), were discussed, including debates on the relationship between public space and architecture, densification and programming of station areas, pedestrian flows management, and data integration.
Following the Paris workshop, the Summer schools *'Integrated Mobility Challenges in Future Metropolitan Areas'* and *'Smart Mobility & Urban Development in Haven-Stad'* took place in August 2018 and 2019 respectively. These were organised in Amsterdam and Delft on behalf of AMS and DIMI, with the collaboration of the ARENA architectural research network, University of Paris-Est, and the City of Amsterdam.

Both the event in Paris and the Summer Schools reinforced the research collaboration between the academic institutions and enlarged the consortium of partners interested in station projects and their role in the future development of the European city.
Since 2020, Role of Stations has evolved in the form of educational courses at the MSc level at the Faculty of Architecture and the Built Environment (City of Innovations project) and several research project proposals for European funding programmes, such as JPI and DUT Urban Europe (Horizon). In both instances, real cases of rail-metro stations in the context of the Rotterdam metropolitan area have been used as pilot projects for design-driven research.



Station as Data Center (Louise Plantin, source: visual note made during the workshops at the 'Gares du Futur/Stations of the Future' event in March 2018)

Station as Destination (Louise Plantin, source: visual note made during the workshops at the 'Gares du Futur/Stations of the Future' event in March 2018)

PROJECT RESULTS

The key station roles

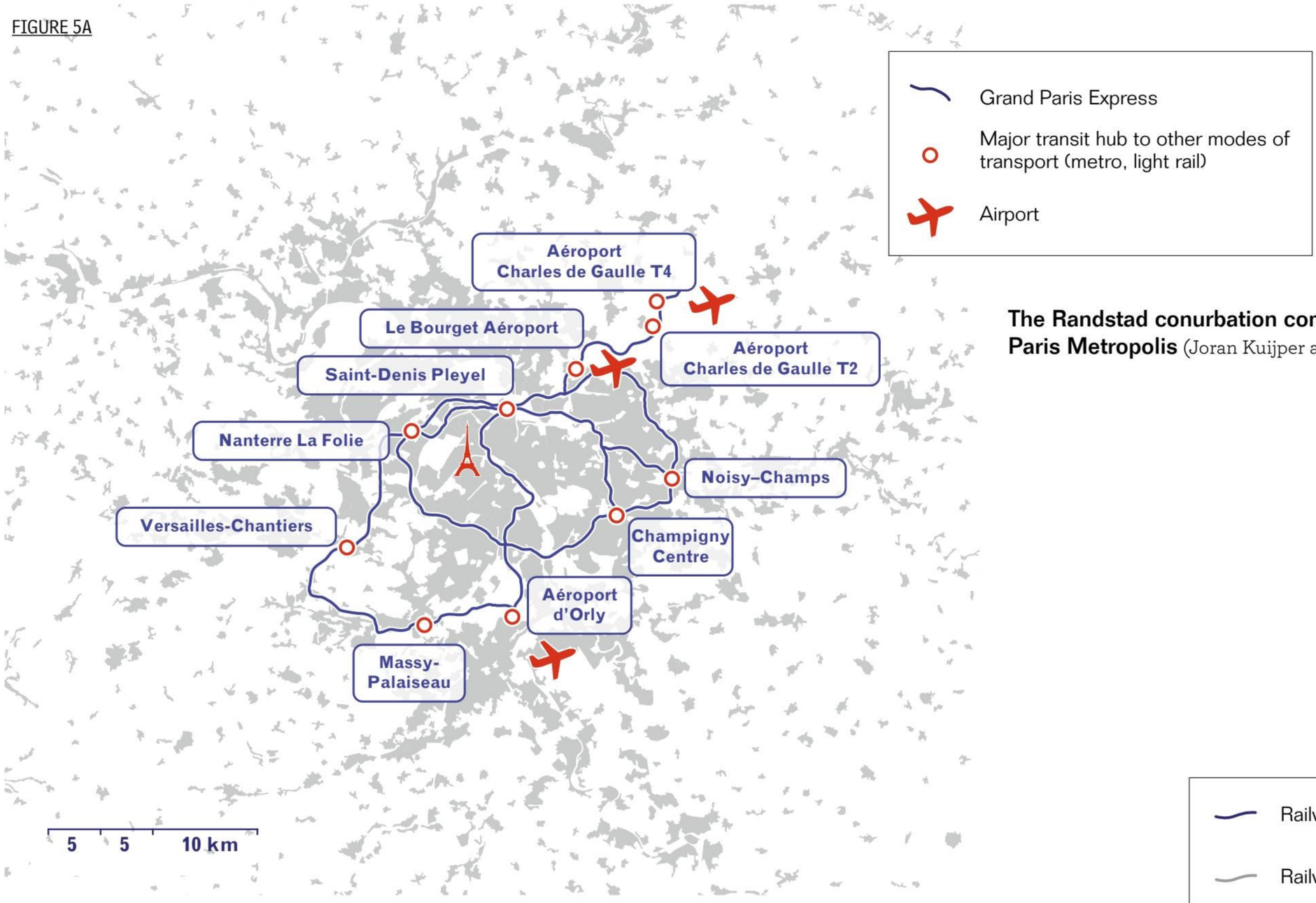
The study of the two rapidly developing metropolitan contexts, the 'Randstad' in the Netherlands and the 'Grand Paris' in France, provided insight into topics that were crucial in defining the relationship between railways stations as hubs and their connections to the urban fabric of the areas in which they are situated. The key elements in organising intermodal transport and serving as catalysts for urban development discussed in Paris are: Station as Intermodal Node (SaN), Station as Destination (SaD), and Station as Data Center (SaC).

Station as Intermodal Node (SaN) – The development of a rail network is often associated with the most ambitious objectives: a tool for economic development and a driver for urban change and social innovation. The intermodal node not only connects different modes of transport but also several urban scale levels (local, regional, international). The main goals to achieve are finding an optimal mix of transport modes for each situation and making it as seamless as possible for the user. How can we design and govern flexibility? New challenges include providing answers to autonomous vehicles, demand-responsive transport, electric vehicles, information technology, and societal changes (e.g., an aging population).

Station as Destination (SaD) – Railway stations have become much more than just places for boarding and disembarking. Instead, they now serve as hubs for work, business, meetings, shopping, and relaxation. Cities have started viewing them as 'Grand Projects' to enhance their image, serving as symbolic and eye-catching entrances to the city. The development of a station project can promote high-quality architecture and the revitalisation of urban areas. Which financial mechanisms work best for a station as a destination?

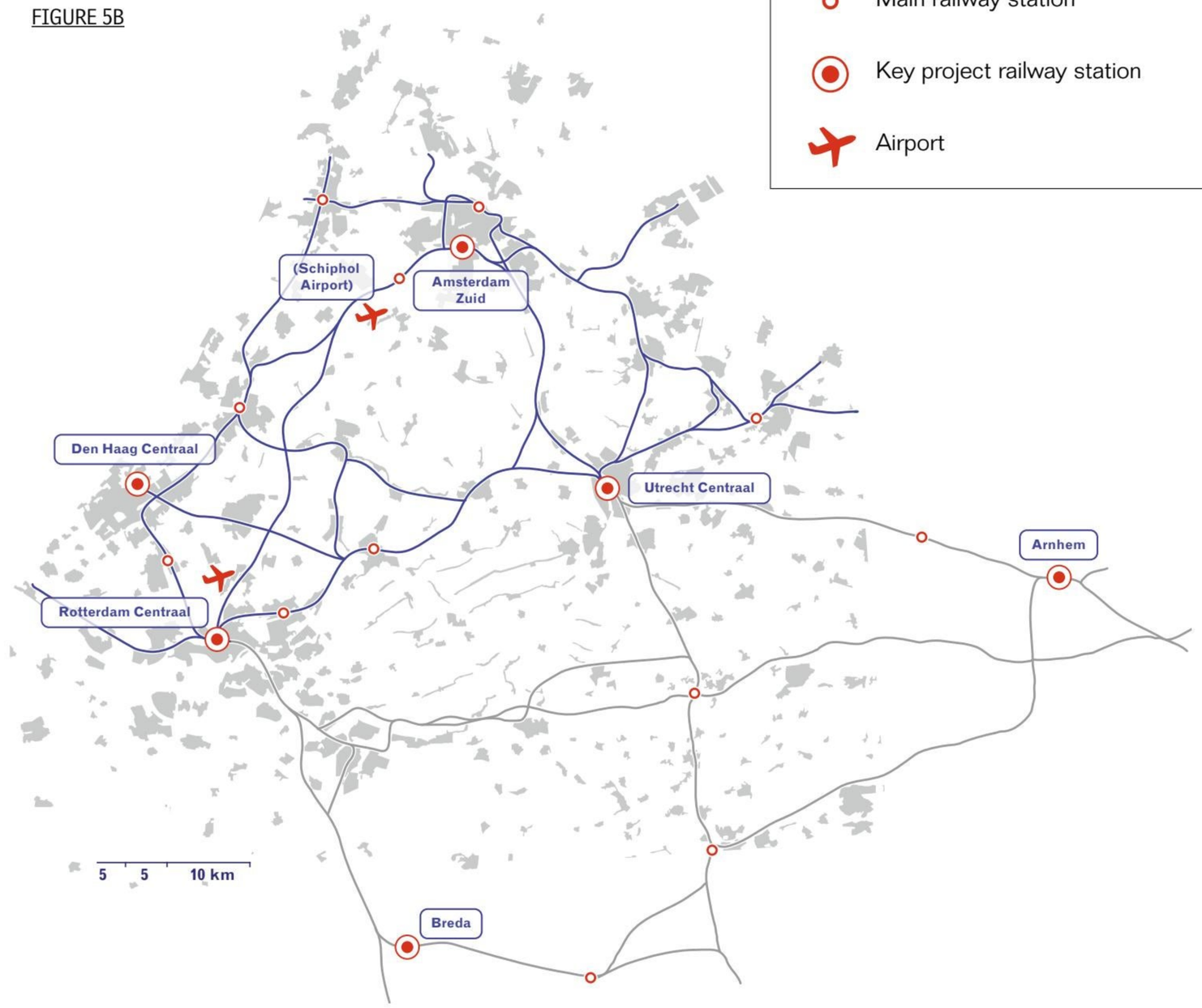
Station as Data Center (SaC) – The use of information and communication technology (ICT) has revolutionised the travel process for those using not only trains but also other means of transport. Technology contributes to enhancing the experience of station users while also creating new demands from passengers using the rail network and managing the new services to be provided, such as being able to change the mode of transfer smoothly and safely and to find real-time and up-to-date information about their journey. The main challenges lie in the integration and cross-fertilisation of data from the various operators of different modalities converging at a station, as well as in integrating stations within their surroundings. This leads to the creation of new and optimal user experiences and designs based on data.

FIGURE 5A



The Randstad conurbation compared with the Grand Paris Metropolis (Joran Kuijper and Manuela Triggianese)

FIGURE 5B



PARTICIPANTS AT THE PARIS EVENT

Prorail; NS Stations, Bureau Spoorbouwmeester, AREP, RATP, GVB, University of Antwerp, Fabrique du Métro, Société du Grand Paris, Fabrique, Movares, Rhônexpress, ENSA Paris-La Villette, International Union of Railways (UIC), SNCF Gares & Connexions, UNStudio, Benthem Crouwel, Provincie Noord-Holland, Delta Metropool Association, Royal Haskoning, SWECO, IFSTTAR, ARTELIA Ville & Transport, GVB, Vinci Construction, La Fabrique de la Cité, APUR, Sensual City Studio, Atelier Novembre, ILEX Paysage Urbanisme, KCAP, Mecanoo, PosadMaxwan, VenhoevenCS, KAAN Architects, Municipality of Maastricht, BNA Onderzoek

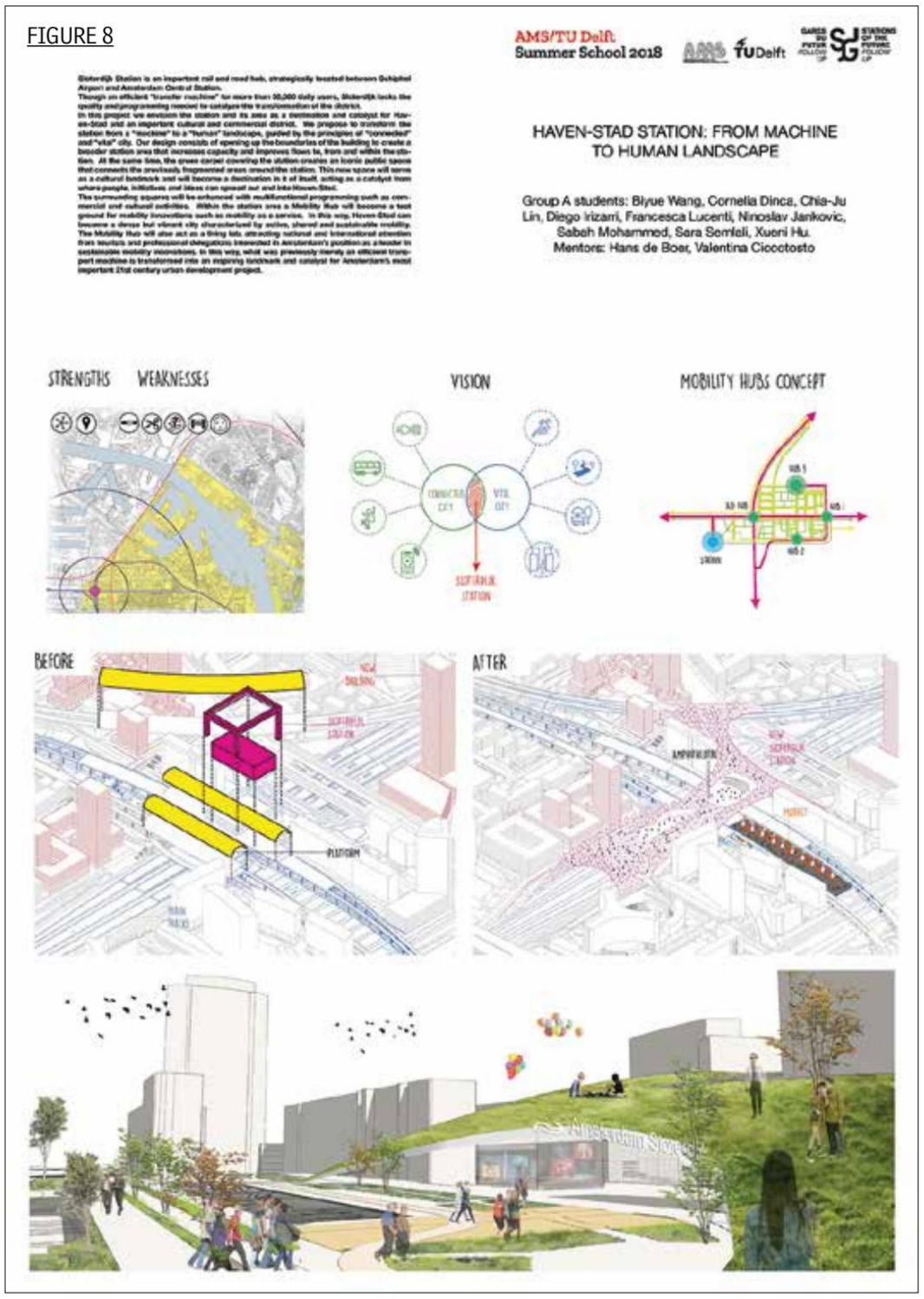
FIGURE 6

‘Gares du Futur/Stations of the Future’ Board of Intentions signed by consortium partners and participants of the plenary session at Atelier Néerlandais Paris, 16th March 2018 (Bart Koetsier)

FIGURE 7

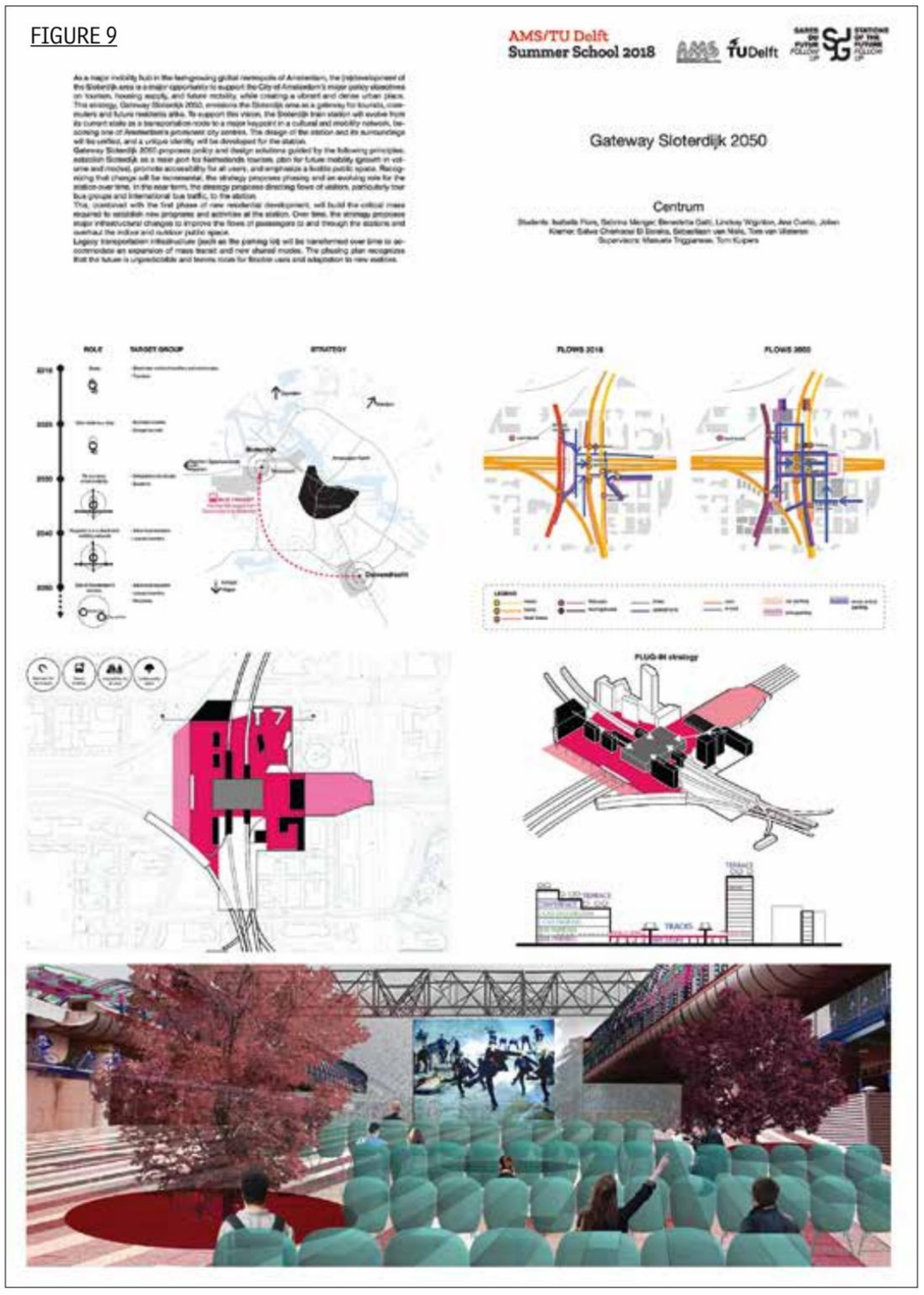
Working sessions at the International Summer School 2018 ‘Integrated Mobility Challenges in future metropolitan areas’ at Delft University of Technology, 23th – 27th August 2018. (Valentina Ciccotosto)

FIGURE 8



Design scenario ‘Havenstad Station: From machine to human landscape’ (Students of the International Summer School 2018 ‘Integrated Mobility Challenges in future metropolitan areas’: Biyue Wang, Cornelia Dince, Chia-Ju Lin, Diego Irizarri, Frabcesca Lucenti, Ninoslav Jankovic, Sabah Mohammed, Sara Semiali, Xueni Hu. Mentors: Hans de Boer, Valentina Ciccotosto)

FIGURE 9



Design scenario ‘Gateway Sloterdijk 2050’ (Students of the International Summer School 2018 ‘Integrated Mobility Challenges in future metropolitan areas’: Isabella Flore, Sabrina Menger, Benedetta Gatti, Lindsay Wiginton, Ana Cvetic, Jolien Kramer, Salwa Cherkaoui El Baraka, Sebastiaan van Niele, Tom van Vilsteren. Mentors: Tom Kuipers, Manuela Triggianese)

Summer schools

Following the Paris workshop, the Summer Schools 'Integrated Mobility Challenges in Future Metropolitan Areas' and 'Smart Mobility & Urban Development in Haven-Stad' expanded the debate among young international professionals, academics, and master's students by examining an important rail-metro node in the metropolitan area of Amsterdam: Sloterdijk Station. This crucial hub in a larger urban area is vital for mobility, exchange, and urban growth. The main question was: which approaches and scenarios can be tested and applied to these intermodal nodes, especially when dealing with limited space and a growing number of users? The results included proposals to improve the Sloterdijk Station area and to make the station a 'future-proof' intermodal hub by suggesting strategies for accommodating new passenger flows, converting parking spaces into drop-off lanes for new shared mobility, and creating flexible programming and adaptable spaces for unforeseen urban conditions.

In the 2018 edition, the Gateway Sloterdijk 2050 Students' Project (example) proposed policy and design solutions guided by the following principles: establishing Sloterdijk as a main port for tourism in the Netherlands, planning for future mobility (growth in volume and modes), promoting accessibility for all users, and emphasising a liveable public space. Recognising that change will be incremental, the strategy proposes phasing and an evolving role for the station over time. The primary goals for developing a new strategy are: to reinforce the integrity of the node in a fragmented urban place, facilitate seamless pedestrian flows, and redevelop the node as a 'place' with a more defined urban character for the current users of the station as well as the future inhabitants and visitors (target group).

The second workshop extended the debate on the Haven-Stad area and employed the 'smart mobility' and 'MaaS' (Mobility as a Service) concepts as a potential means for the urban integration of mobility nodes and new urban developments in the northern part of Amsterdam, connecting the two sides of the river.

FIGURE 10A

FIGURE 10B

Autonomous City, day and night (Jelle Boorsma, Nico Stutz, Yannick Bakker)

FIGURE 11A

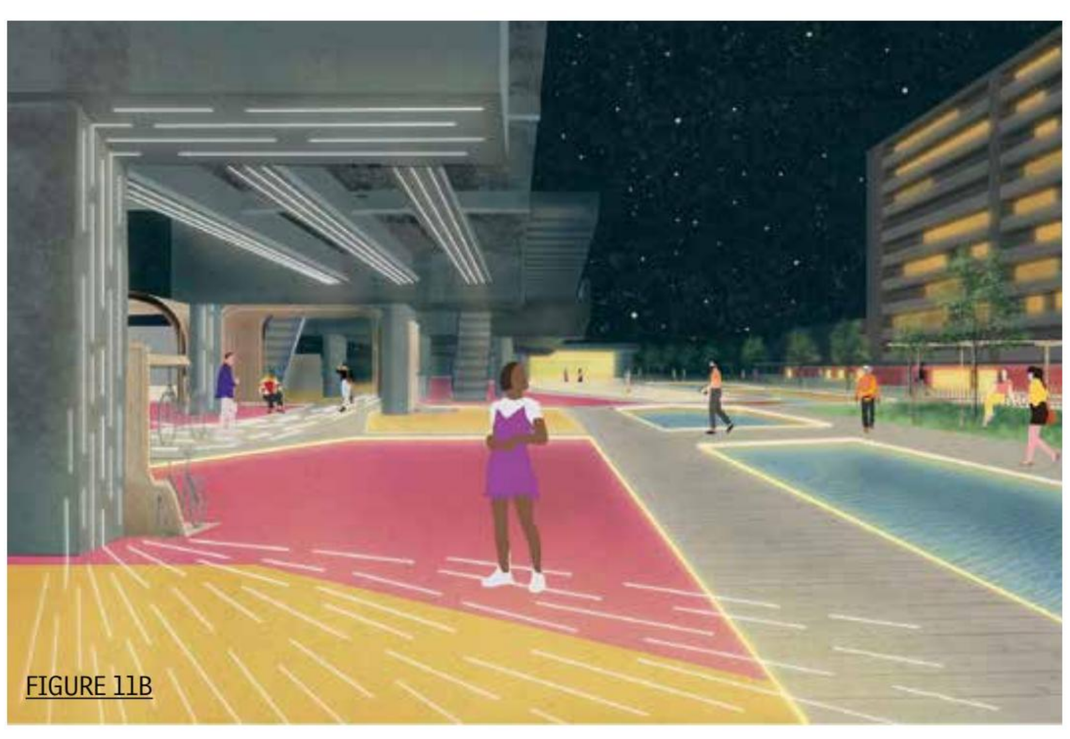


FIGURE 11B

Recharging Slinge, day and night (Fruzsina Kovács, Mats Kolmas, Melanie Waidler, Mirko Cestari, Olivia Wong)

EVALUATION

Enhancing station – area synergies

Stations and station areas are more than ever places of transformation. As a result, alongside updating and upgrading the railway-related functions, there is a constantly growing need to enhance and often maximise the interplay and synergies between stations and their surrounding areas on various scale levels. For these reasons, the theme has garnered attention from an increasing number of disciplines in academia, practice, and among involved institutions. The challenge of linking different, sometimes even divergent, expertise and approaches has been the leitmotif of the Role of Stations project throughout these years. The strategy of placing spatial issues at the core and adopting a design-oriented approach to interconnect the agenda and interests of various participants has been key for each initiative and event. At the same time, the success of initiatives such as Stations of the Future has contributed to the increased interest of non-design disciplines to be part of the project and to the strengthening of international networks (Paris, Polimi Milan, Hafen City University Hamburg, University of Antwerp, among others).[1]

Implementation in education

Role of Stations has established a strong connection with education through international summer schools and, since 2020, with several MSc courses and interdisciplinary graduation projects at the Department of Architecture. The MSc2 elective course 'City of Innovations Project' (CoI) benefits from the contributions of the City of Rotterdam and several design experts on station developments. This elective allows students to develop research-based design projects with a strong exploratory approach, aiming to connect education to urgent issues in dialogue with stakeholders outside TU Delft. The studio is organised using the charrette method (a period of intense design activity and short-term design projects, developed in teams), focusing on several sub-urban stations with different characteristics in the Rotterdam Zuid area. In 2021 the following stations locations were analysed: Rotterdam Zuid, Zuidplein, and Slinge. Students begin with an urban analysis of the station areas on different scale levels (the city, the neighbourhood, the building). They develop initial scenarios for the studied areas after a gaming session, during which they play the roles of stakeholders (city, public transport providers, investors, activists) to achieve a consensus for a common agenda. Following the 'stakeholder workshop', students incorporate the research results into spatial criteria and quality requirements. With varying priorities, the students develop different scenarios on both the urban and architectural scales for a more sustainable and inclusive station within the context of new mobility implementation. Two examples:

- *Autonomous City*: this scenario proposes the creation of an autonomous, sharing, and connected society. It relies on a society that is aware of climate change, sustainable choices, and a willingness to share their modes of transport. The focus is on adaptive streetscapes, shared mobility, and the Internet of Things (Figure 10A and B).

- *Recharging Slinge*: the goal of this vision is to transform Slinge station from a place into a space by incorporating and reactivating existing public spaces and reconnecting the east and west sides of the neighbourhoods. This is primarily a pedestrian-centred approach, breaking down the barrier of the station, improving social safety, and creating cohesion between Pendrecht and Zuidwijk by adding cultural activities and transforming the station area into a community hub (Figure 11A and B).

Students were invited to reflect on the importance of transport networks within and extending from the city, considering how they shape the urban territories. The conclusions focused on the negotiations between architecture, urban design, network infrastructure, public realm, policy & governance, and the territory. The work is published in a book series called *City of Innovations* in the volumes *Living Stations, Inclusive Stations, and Transit Stations* with TU Open.[2]

CONCLUSION

Enhancing adaptive station design

The intention of the cross-disciplinary Role of Stations research is twofold. Firstly, the programme aims to

influence, implement, and contribute to the ongoing Future of Public Transport 2040 policy of the Ministry of Infrastructure & Water Management (I&W) through a research-driven approach that brings together various types of expertise by using the design activity as a collaborative research methodology. Secondly, the programme has established a consortium of public and private partners involved in station projects. Viewing the station as a focal point in the mobility network, this research is also closely connected with the DIMI initiatives 'Stad van de Toekomst' and 'Zaancorridor', which are also part of this publication. Furthermore, the Role of Stations project has increased awareness of design potentials in helping to define adaptive characteristics of stations among city makers and involved stakeholders. Through design studios and workshops, the project has placed design-driven research at the core of urban transformation related to infrastructural changes. Many consortium partners and professionals engaged in the project activities have been involved in the design studios, workshops, and in the preparation of several calls for proposals, expanding the existing network of partners established within the project's activities.

An example of a follow-up to Role of Stations is the Walk-In (Widening sustAinable mobiLity networKs: Impact on Nodes) project that recently received funding from the Dutch Research Council (NWO), which focuses on the challenges, potential, and role of peripheral stations in the Rotterdam metropolitan area. The project specifically targets small and medium-sized suburban transit stations, characterised by a combination of modes and P+R locations. With the Dutch government's goal to build one million homes in the next twenty years, these stations areas will become densified and completely transformed. Walk-In proposes a toolkit for designers that assists in conversation with different actors when making decisions. It is developed in collaboration with academia and public and private partners. Walk-In uses the design process as a method of collaboration with policy makers and designers involved in station projects. DIMI is part of the consortium together with Delta Metropool Association, the offices of PosadMaxwan, De Zwarte Hond, Mecanoo, the Ministry of I&W, ProRail, and the Provinces of South Holland and North Holland.[3]

Longue Durée

The research methodology developed throughout the Role of Stations project consists of a strong interchange between design research, design practice, and design education. It has allowed for exploring new ways of collaborating with non-academic partners and students while laying the foundation for new research questions. For example, the Walk-In has also developed a new network and an EU funding proposal for the Driving Urban Transitions from the Joint Programme Initiative Urban Europe, submitted in November 2022 by Manuela Triggianese (main applicant) and Hans de Boer (project coordinator with DIMI). This proposal focuses on the concept of the 15-minute city, which represents an opportunity for transit stations in neglected peri-urban areas to be reprogrammed. It concentrates on the complex interdisciplinary issue of (re)developing underused station locations as objects of research and (re)design within a transdisciplinary stakeholder context. A collaboration between four European countries (Netherlands, Belgium, France, Italy) has been established, consisting of 14 partners in total: 4 universities, 4 urban public authorities, 2 NGOs, 1 rail-infrastructure manager, 1 social housing association, and EAAE. The project setup is embedded in collaborative learning, knowledge production and dissemination by academics and practitioners, from the local stakeholder context to the wider public. This project has laid the foundation for other potential research programmes that the follow-ups of Role of Stations can still be connected to, such as a new application for a Marie Skłodowska-Curie Action (Innovative Training Network).

1. The open access publication *'Stations as Nodes'* contains the results of the project activities: https://books.open.tudelft.nl/home/catalog/book/27
2. The open access publications are part of the *'City of Innovations'* series: https://books.open.tudelft.nl/home/catalog/series/city-of-innovations
3. More information about the Walk-In project can be found here in the interview 'Attractive public transport starts with a good design of the station' with Manuela Triggianese for DIMi stories: https://www.tudelft.nl/en/infrastructures/dimi-stories/attractive-public-transport-starts-with-a-good-design-of-the-station

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