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Stations as Nodes

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**exploring the role of stations
in future metropolitan areas
from a French and Dutch
perspective**

**Delft University of Technology,
Faculty of Architecture and the Built Environment**

Delft Deltas, Infrastructures & Mobility Initiative

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The Randstad and Grand Paris: New Metropolitan Challenges

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In the 21st century clusters of well-connected cities are becoming a reality in Europe, since the creation of the term megalopolis in 1961 by Gottmann, that defined metropolitan areas with the following characteristics: big center of reference, the physical discontinuity of the urban settlement, the functional continuity of the network as independent to the minor urban settlements, the economic force.¹ According to Gregotti, despite of globalization processes and the emerging informational society (also known as network society), Gottmann's previsions are influencing contemporary conditions in Europe.² From 'global' cities to 'mega-city' regions, European metropolitan areas are facing new challenges, as the one to maintain and even strengthen their positions among the most attractive international cities. For this reason, they are making strategic plans on several urban scales, most of the time associated to the development of their public transport corridors (rail and highway), such as for Great London, Greater Berlin, Ruhr area or Greater Paris Metropolis. The main objective of their plans is the sustainable development of the region's economy and employment.

None of these European cities have a defined border, being the condition that makes them all comparable. In the Netherlands, the most important Dutch metropolitan area is called 'Randstad', a conurbation of four big cities - Amsterdam, Rotterdam, The Hague, Utrecht - and at least six smaller ones, which are linked by suburban extensions. Both the Randstad

and the Greater Paris Metropolis, also known as the Grand Paris, have a long history of infrastructural planning and both are facing similar challenges to update/upgrade their rail-metro networks and to densify the territory through strategic urban interventions situated along these corridors, most likely around existing or new stations, here called hubs. What is the role of the hubs as nodes and places along the networks of future metropolitan areas? This question became also the starting point for the French-Dutch debate that took place in March at the Atelier Néerlandais in Paris.

If we look at the numbers, the urbanized Grand Paris has a surface of 170,000 ha and a population of 12M inhabitants. Its (urban) density is 70/HA. When compared to urbanized Randstad with a surface 108.000 ha, population of 9M and the (urban) density of 83/HA, we see that these two urban realities or metropolis are rather similar.³ I will hereby give a brief introduction about the plans that these two countries are developing to cope with their urban challenges: the Grand Paris Express project and the scenario of the Randstad 2040, that has been followed by the policy document of the future of public transport towards 2040 in the Netherlands (in Dutch Toekomst openbaar Vervoer 2040).⁴

Grand Paris Express

In the Grand Paris plan the focus is the creation of a public transport network (train/metro) towards a better connection with the airports and TGV stations. The aim is to provide a framework to link the region's main economic centres, as well to support local development with the network's future stations as key points of focus. With

22,6 billion € investment, the Grand Paris Express (GPE) is part of the Grand Paris project announced in 2007, under Nicolas Sarkozy's presidency, to develop Greater Paris into a sustainable metropolitan area. Société du Grand Paris (SGP) is the overall project owner and contracting authority and the state-owned public transport operator Régie Autonome des Transports Parisiens (RATP) is the operator of the network. Within the scope of this initiative, the GPE will cover 200km of new and fully automatic metro lines and 68 stations with the aim of providing direct connectivity among suburban districts/neighborhoods and with the city center, improving the connections to TGV stations and the airports. At the same time the emergence of the GPE will be a great boost to the city attractiveness and financial center, as being not only a network but also an urban growth accelerator. In less than ten years, Paris may play host to two major international events: the Olympics in 2024 and the World Expo in 2025. The GPE train stations, which will combine very significant users' flows, up to 3 million passengers per day, with property potential that will create a host of opportunities, will give substance to the Grand Paris project for millions of Ile-de-France residents.

"The new subway lines will open up the poorest neighborhoods around railway stations and enhance the international attractiveness of Greater Paris", says Catherine Barbé during the workshop, Director of Strategic Partnerships at Greater Paris Authority (Société du Grand Paris-SGP). She presented the research 'Observatory of the Grand Paris Express Station Neighborhoods' carried out by the Paris Urbanism Agency (Apar) in 2013. This work is set up as a tool to understand and analyze all the future station neighborhoods in the Grand Paris Express network, through monographic studies covering

each neighborhood and cross-analyses of the planned GPE lines. These analyses cover 6 themes: densities, centralities, the urban and landscape context, demographic, family and social changes, mobility and the dynamics of construction and urban projects. It has made possible to describe and compare the urban and social characteristics of the 68 neighborhoods which will accommodate the future Grand Paris Express stations and which can be used as a decision-making tool for the new developments.⁵ Furthermore, SGP intends to use private funds to finance cultural and artistic programming in the GPE neighborhoods. Artistic projects will spotlight and breathe life into 68 stations and their districts, endowing each of them with their own personality.

Furthermore, with the launch of the international consultation for stations in the Greater Paris area, Jacques Ferrier architecture in association with the Sensual City Studio developed the station concept of "Gare Sensuelle", that was presented in Paris and it is illustrated in this publication. The designers became responsible for the design and architectural consultancy for the 68 new railway stations of the GPE, commissioned by SGP. This concept was intended to define stations according to the specific features of the environment in which they are located, to deliver efficient and user-friendly spaces for the use of travelers, which are both open to the city and marked by common characteristics for the entire network. For each station neighborhoods, a specific answer has been addressed to each geographical, social and economic context and providing connections with almost every existing train and metro lines.

At the same time in 2016, the Prime Minister and the Chairman of the Métropole du Grand Paris (MGP - Greater Paris Metropolitan Area) launched an in-

ternational competition, called 'Hubs du Grand Paris' along with the subsequent 'Inventing Greater Paris Metropolis' final exhibition. The aim was to challenge international talents to plan the future of 19 neighborhoods that will host stations of the Grand Paris Express. The station projects (that include the development of the buildings and their districts) were thus designed to be demonstrators of the smart and sustainable 21st century city, including construction, economy, energy, logistics, as well as social and civic life, culture, multimodal services, digital technology. In conjunction with the development of the GPE transportation network, these projects have made the Grand Paris one of the most dynamic metropolitan areas in the World.⁶

The completion of the Grand Paris Express is accompanied also by the foundation of La Fabrique du Métro. Like the stations of the future, which will host shared workspaces, La Fabrique du Métro is an exhibition and co-working place, welcoming innovation stakeholders working in mobility, digital, services, customer information and construction sectors. Engineers, students and employees of the Société du Grand Paris are working side by side to build the new metro. During the Stations of the Future event, French and Dutch professionals and experts in station design visited the exhibition.

Randstad 2040

The Randstad region, a conurbation formed by the capital Amsterdam, Rotterdam, The Hague and Utrecht, covers 26% of the Dutch territory and is home to 46% of its population. It is necessary that the cities and towns in the west of the Netherlands, the economic engine of the country, start to function as one region, thus competing with other metropolitan areas in Europe and the world. Some

comparison to other conurbation areas are not only with Paris with 11 million inhabitants, but also with London 9 million inhabitants, almost 4.4 million people live in the Barcelona metropolitan area and 5.1 million in Madrid. In the 21st century the Dutch government decided to improve all main stations and their districts that are more or less linked to the high-speed railway (HSR) network. They are called the 'Nationale Sleutelprojecten' (in English National Key Projects). The government decided to invest more than 1 billion euros on the renovation of six stations served by the HSR: Utrecht CS, Rotterdam CS, The Hague CS, Amsterdam-South, Breda and Arnhem CS.⁷ The key projects had to include a total of 3.7 million m² densification program, in which will be build 1.6 million m² offices, 1.4 million m² residential and the rest for urban facilities. This was a great opportunity for the Randstad to compete with other European cities. Nevertheless, many station projects have been downscaled (as for Rotterdam Central station and its district) while for others the planning has been taken over 20 years, as the case of Amsterdam South. Only in 2018 the construction of the new station South and the highway beside the station has started. Several station models and development plans have been drawn for this key project. "In the new model, value creation based on retail development has been used to optimize the plans", says Sebastiaan de Wilde during the event, Director of Station Development and Maintenance at NS Stations. Amsterdam South, as part of the Zuidas project (station area development), is the last of the six key projects that still needs to be built.

In September 2008, the structural vision on the future of the region entitled "Randstad towards 2040" gives importance to the development of accessibility between Dutch cities for the spatial develop-

ment of the region with a new generation of key projects (replaced later by the structural vision on infrastructure and space 2013).⁸ The ambition is to strengthen the Randstad for the long-term to address declining liveability, climate change, mobility issues, sustained high demand on space and pressure on our international competitive position. According to the proposed scenario, in conjunction with urbanisation, accessibility in the northern and southern Randstad needs a more quality-oriented approach. Improved housing market performance and accessibility are among the most pressing issues in the Randstad. Investment in public transport, roads and station construction are closely interrelated in the government's vision who is willing to facilitate greater interaction between the various residential and working environments.

An important condition is to improve links within the Amsterdam-Almere-Utrecht region (North Wing of the Randstad) and Rotterdam-The Hague region or MRDH (South Wing of the Randstad), allowing both to perform more effectively as metropolitan city-regions. Faster and better links to the main ports will also improve the economic dynamism of the Randstad. The ambition is to accommodate synergy in space-road-rail at nodal points of the public transport networks, exploring the potentials of a 'second generation of key projects' as stations situated along rail-metro networks, to play a significant role in the growth of the region. For example, the Stedenbaan project in the MRDH region consists of 35 stations (32 existing and 3 new) identified as potential locations of new development in a radius of roughly 1200 meters around them. Concrete ambitions have been attached to the development of these station areas including new dwellings, office space and other non-transport related facilities. At

the same time the sub-regions that compose the Randstad, (North Wing and South Wing) have their own approaches to tackle with their developments. These are for examples projects such as Stedenbaan and the Randstadrail in the MRDH.⁹

Several researches on stations as drivers of urban regeneration – by using TOD Transit Oriented Development approaches - in the metropolitan regions of the Randstad, have been made in the last years. Public transport hubs and corridors are compared and positioned in the metropolitan networks. In the province of Noord-Holland for example eight corridors are appointed by the project 'Maak Plaats! (Make Space!)'.¹⁰ These corridors either start or end at the Ring of Amsterdam, at Amsterdam Central station or Amsterdam South station. The project brought together studies, the available knowledge and data, providing insight into the opportunities for better utilization of public transport hubs in the Province of North Holland. This work will come back later in this publication with the contribution by Paul Chorus, TOD policy advisor at the Province.

The Zaancorridor is one of the analyzed corridors which could play an important role to the development of the metropolitan area of Amsterdam (MRA). For this reason, in 2014 the research project 'Designing TOD – opportunities for the Zaancorridor' was carried out by professional teams of designers and the stakeholders involved in the case studies/station areas situated along this corridor.

In line with these considerations, the new Noordzuidlijn metro line in Amsterdam can be considered as an important connector within the city as well as urban catalyzer for the future urban developments envisioned in the metropolitan areas. The recently opened line and its metro-stations have been presented by their designers

Bentham Crowel Architecten in the event in Paris.

“In the past decades we worked on implementing both a high-speed line and regional light rail lines to our major stations, that all got a big upgrade. We made them not only efficient transit machines, but great places to meet, work and stay. The bike is a great feeder of Dutch public transport. Currently we face a task to build 1 M homes and extend the transformation from 6 to 60 or even 600 stations,” says Daan Zandbelt, Dutch State Advisor for the Physical Living Environment. In line with these considerations, everyone in the Netherlands should be able to travel quickly, easily, reliably and affordable with public transport (OV). This is the motto of the Ministry of Infrastructure and Water Management, that together with twelve provinces, the metropolitan regions of Amsterdam, the MRDH region and the railways, works on a future image of public transport 2040 (in Dutch Toekomst Openbaar Vervoer 2040). This vision of the future gives direction towards a ‘smart’ and flexible public transport to the policy of the government and its implementation together with partners.”

Notes

1

Megalopolis or mega-region is a clustered network of cities. The term was introduced in 1915 by Patrick Geddes’ book *Cities in Evolution*. Later, it was used by Jean Gottmann in the 1961 study, *Megalopolis: The Urbanized North-eastern Seaboard of the United States*, to describe the chain of metropolitan areas from Boston, through New York City and ending in Washington. See also: Peter Hall and Kathy Pain, *The polycentric metropolis. Learning from mega-city regions in Europe*, pub-

lished by Earthscan, 2006

2

See Castells, M. (1996) *The Rise of the Network Society. The Information Age: Economy, Society and Culture*, Vol. I., Oxford, Blackwell, and Gregotti, V. (2011) *Megalopoli e città-teritorio in Architettura e Post metropoli*, Einaudi, Torino

3

Studio Secchi Vigano’, *Habiter le Grand Paris*, Study realised for the Atelier International du Grand Paris, Oct. 2013

4

<https://www.rijksoverheid.nl/onderwerpen/openbaar-vervoer/betere-verbindingen-openbaar-vervoer/ov-in-de-toekomst>

5

A summary of all the work of the Observatory of GPE station neighborhoods (in French Observatoire des quartiers des gares) has been published and it can be found online.

6

See: Consultation Internationale Inventons la Métropole du Grand Paris, publication Pavillon de l’Arsenal. 2017

7

The National Key Projects were presented by Miguel Loos at the Stations of the Future event. He is senior advisor for architecture and urbanism at Bureau Spoorbouwmeester, an independent consulting bureau on design guidelines for and on behalf of the Dutch railway companies NS and ProRail.

8

Summary of the structural Vision *Randstad 2040*, Ministry of Infrastructure and the Environment, 2008. VROM (2006). Nota Ruimte. Ruimte voor Ontwikkeling; Zuidvleugel Stedenbaan (2010). Steenbaan Monitor. Vastgesteld door de Bestu-

urlijke Commissie Stedenbaan.

9

More information on Stedenbaan (www.stedenbaan.nl) and the RandstadRail (<https://www.overhtn.nl/nl/over-ons/ons-vervoer/randstadrail/>)

10

The publication *Maak Plaats! (Make Space!)* by Delta Metropolis Association and the province of North Holland, presents a new vision on the use of space in the province. The time is ripe for transit-oriented development; a smart growth strategy focused on a more efficient use of the existing city and its existing infrastructure network. The program for transit-oriented development is one of implementation programs of the Structural Vision Noord-Holland (Strategic Plan for the province of Noord-Holland 2040). Its goal is to better utilize the land around stations for housing and other urban functions. The ‘Designing TOD – opportunities for the Zaancorridor’ is a research project by BNA - The Royal Institute of Dutch Architects – based on the investigation of 5 nodes along the corridor by using TOD. The project brings together designers, stakeholders, municipalities and academia in order to find answers on the central question for the near future. The results of this project have been published in *Onderweg! (Under way!)* BNA Onderzoek (January 2015).

11

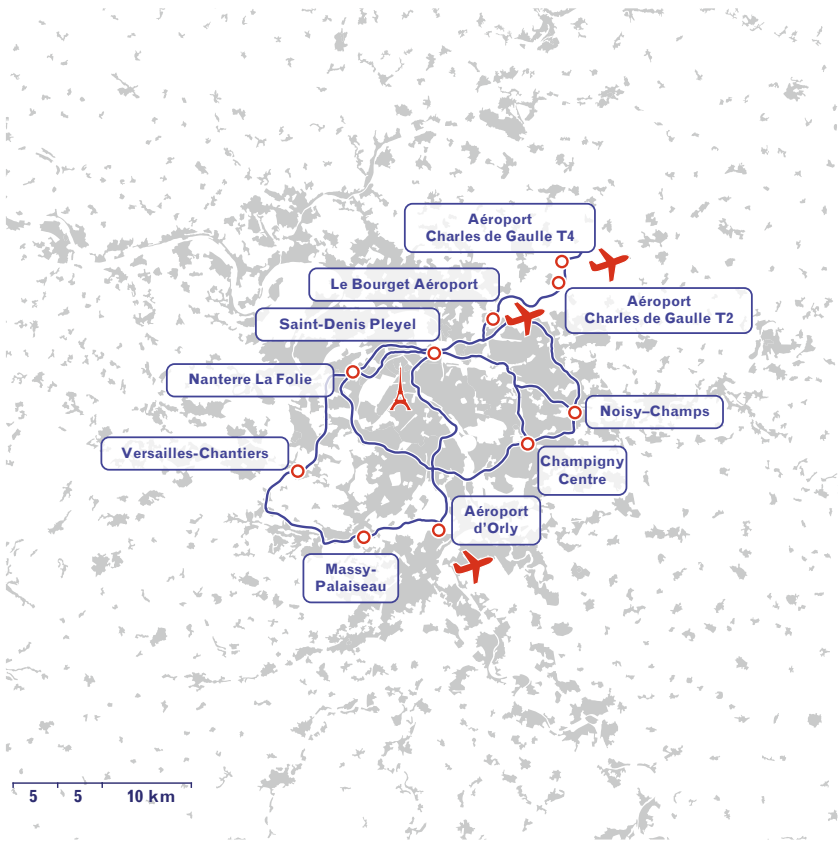
For more insight on the vision of the future of public transport in the Netherlands, visit: <https://www.rijksoverheid.nl/onderwerpen/openbaar-vervoer/betere-verbindingen-openbaar-vervoer/ov-in-de-toekomst>




France, Île-de-France: Grand Paris Express

▼
The Grand Paris Express is part of the Grand Paris project announced in 2007, under Nicolas Sarkozy's presidency, to develop Greater Paris into a sustainable metropolitan area. Société du Grand Paris (SGP) is the overall project owner and contracting authority and the state-owned public transport operator Régie Autonome des Transports Parisiens (RATP) is the operator of the network. Map by Joran Kuijper, based on the maps in the paper ATE-LIER INTERNATIONAL DU GRAND PARIS, *Urbanised Grand Paris*Habiter le Grand Paris © Studio_013, Secchi Viganò—l'habitabilité des territoires: cycles de vie, continuité urbaine, métropole horizontale.

Surface: 170,000 HA
Population: 12M
Density (urban): 70/HA

94



-  Grand Paris Express
-  major transit hub to other modes of transport (metro, light rail)
-  airport

Decades ago the Dutch government planned to invest more than 1 billion Euros on the renovation of six stations that would serve a high speed line. These projects are known as the New Key Projects (NSP). As the owners of almost all stations in the Netherlands, NS Stations and ProRail are closely involved in redevelopment of NSP.

Four of them are in The Randstad, which is a conurbation of four big cities – Amsterdam, Rotterdam, The Hague, Utrecht – and at least six smaller ones, which are linked by suburban extensions.

Map by Joran Kuijper, based on the maps in the paper ATELIER INTERNATIONAL DU GRAND PARIS, *Urbanised Randstad Habiter le Grand Paris* © Studio_013, Secchi Viganò—l'habitabilité des territoires: cycles de vie, continuité urbaine, métropole horizontale.

Surface: 108,000 HA
 Population: 9M
 Density (urban): 83/HA

The Netherlands, Randstad: National Key Projects

