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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

Amsterdam Institute for Advanced Metropolitan Solutions

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Mobility as a Driver of Urban Change

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Undoubtedly there is an unbreakable relation between the changes in human mobility and the appearance of our cities. A town for pedestrians and horses has different physical characteristics than our contemporary city. Over centuries, European cities have developed into what they are now, strongly influenced by military, political, cultural and economic logic. For example, the traces of the water city are still apparent today in many Dutch cities, where canals once served as the main transport system.

The way we move goods and people has a defining impact on the way we inscribe the territory and thus how we organize our cities and how they take their physical shape. Naturally intersections of infrastructure within the urban territory generate extra activity and therefore those knots can become strong drivers of change. The marketplace, a bridge, a hostel at the crossing of important routes, a train station or an airport become catalysers of urban transformations. Railway and subway stations, harbour terminals, ring roads, service stations, interchanges, underpasses, viaducts and airports, in short, cover a relevant portion of the landscape. Infrastructure and especially the railway has always played an important role in urban planning, changing the character of urban form, becoming the generator of new architectural typologies and urban configurations. The railway terminus, for instance, often served as the focus for planning or replanning towns and city centres. New York's Grand Central Station (1911) is an exemplary case, which has 'shaped the destiny of Manhattan'.¹

The nineteenth century marks the birth of the railway. Railway stations not only heralded a new age of travel, they took the form of city gates with a monumental character. More than the role of entrance into the city, as demonstrated by the great Victorian station King's Cross in London (1852) or Cuypers' Central Station in Amsterdam with its Renaissance-derived façade (1881–1889), the station also provided urban and rural populations with a social centre, acting as a focal point for the community, as a centre of the industrial society.²

There are, in fact, different types of trains. The ones that travel long distance and cross the continents, and the metropolitan trains that support the growth of the Metropolis.

Since its origin in Europe during the Industrial Revolution, rail transport has relied on heavy investment in tracks crossing the territory and train stations at important junctions and on the edges of cities. The train has spurred territorial polarity and strong densifications at hubs. Once the lines are in place and the intersections have been formed, flexibility is practically gone. The train is bound to tracks, it's a 'vectoral' modus of transport. The knots in the system become very dominant in the development of the metropolitan area.

The twentieth century brought us the car, a much more versatile and flexible vehicle. Though it cruises the road it can be used on roads that vary from a simple sandy lane to a hypermodern motorway. By car we can go anywhere. The car spurs sprawl. It gave birth to the Megalopolis. In the beginning the radius of cars was limited and for longer travel we still depended on the train, but towards the second half of the twentieth century we could cross Europe or the USA by car as easily as by train. Nevertheless, the train, a collective modality, with its dependence on high investment is likely to be a transport mode with a public character, the car is very suitable as a private asset. The car became the symbol of the twentieth-century rise and freedom of the middle class, its impact was so big that a car-oriented society developed. The car made it possible for urban territory to expand over large areas with suburbs and new towns to spring up anywhere. The car was the main driver of sprawl.

Another important development in the twentieth century was transport by air. Over decades the airplane became available to the middle class to move around on a global scale. The airplane is not bound to tracks, but it relies heavily on the existence of proper and safe facilities to land and take off: the airport. Basically, the airplane also spurs multipolarity, but on a global scale: airports became a network connecting the global metropolitan city-regions.

European cities have grown and developed as sprawling and fragmented entities interconnected by a system of infrastructure, in which transport networks have assumed a prominent visibility and importance. After the Second World War, the development of the city in the Netherlands, for example, was mostly driven by land and air transport, that for the first time took over the system of canals.

Near the end of the twentieth century the high-speed (HS) train, a new modality, brings the train back into competition with the car for distances of 100 to 300 km and with the airplane for distances of 300 to 1,000 km. Since the fast train is compatible with the stations of the 'regional' train, it impacts heavily on urban development. Most train stations go back a long time and are positioned at very strategic locations in the metropolitan areas. The fast train also makes use of these hubs. It does not need a remote site from the city, like an airport does, but the fast train can simply enter the heart of the city. With the fast train the 'vectoral' modality makes a comeback and

further sprawl can be limited. Therefore, the last decades we can see a revival of high density city centres. This development makes the train station once again one of the most important 'intermodal nodes' and therefore a driver of urban change, especially when it is also linked to a high-performing road system and near a global hub, such as an airport.

This century – characterized by a mobile society³ – represented a turning point in the history of railways in Europe, observing increased shares of high-speed trains (HST) and light rail + metro lines in the modal split of passenger transport. Looking at the HST stations and also airport stations with the increase of mobility and number of users, a new category of buildings has appeared with complex programmes never defined but always in continuous development. Particularly the building of HST station leads to very high expectations for the growth of the surrounding neighbourhood. When located in the middle of the city, or in dense urban areas, the station leads to large-scale development plans, as happened in the Netherlands with the national key projects⁴, while when located on the periphery, such as Lyon-Satolas in France, the big plans have yet to prove that they are indeed catalysts for the region's growth.

Since a train station is and has been at the heart of so many changes in the city over the last 200 years, it represents an important case study to analyse. The complexity of the redevelopment of a station building and its district has to do with several factors: the number of stakeholders involved, their ambitions and expectations, the financial conditions and unpredictable economic and political fluctuations, as well as the urban configurations of the station location – being both an infrastructural project and an architectural and urban design intervention.

In line with the assumption that 'mobility is a driver of urban change', at the Chair of Complex Projects, Department of Architecture at the Faculty of Architecture and the Built Environment Delft University of Technology, we are working in collaboration with Amsterdam Institute for Advanced Metropolitan Solutions and Deltas, Infrastructure & Mobility Initiative on an education and research project with the Randstad (the Dutch Metropolis) as a living laboratory. In this project we assume that urban changes are primarily dictated by economically strategic areas that grow more rapidly than others, such as areas around mobility infrastructure and intermodal nodes, like stations and airports. The station as a strategic intervention is the focus of the research initiative presented in this publication on French-Dutch approaches.

In the process of 'permanent change' of mobility modalities, the pressure is on main stations and it is increasing their spatial, organizational and financial constraints. Crucial questions for the design are: How can new mobility concepts be integrated with the station being a public transport hub? In complex projects with numerous

stakeholders and long lead times the scope itself is subject to design. The need to share the proposals and discuss them with stakeholders demands a design approach to establish the communication and to develop the scope. Therefore, design is not only seen as an activity to develop a model for a possible future but design is also a tool for communication.

Our approach in education, as illustrated in this publication by the summer school 'Integrated Mobility Challenges in Future Metropolitan Areas', is to use the design of strategic urban interventions as a didactic research tool for training students to develop a narrative and an open and curious attitude about design solutions and products of the design process. Especially on the subject of large-scale projects, where the interplay between multiple actors and the complex interventions gets another dimension, the notions of 'learning through doing' and 'thinking through design' are important.



Notes

¹
See Parissien, Steven.
'Station to Station' 1997

²
In the catalogue of the itinerant
exhibition at the Centre Pom-
pidou *Les Temps des Gares*
(1978) Jean Dethier presented
great stations as 'centers
of the industrial society'.

³
For a definition of mobile society
see Bertolini Luca. Fostering
Urbanity in a Mobile Society:
Linking Concepts and Practices,
Journal of Urban Design, Vol.
11. No. 3, 319–334, Oct. 2006

⁴
Due to this complexity, many
station projects can take 10 up
to 20 years to be finalized, as
demonstrated by the Dutch
key projects, the development
of the main (new) stations and
urban programs around them
in the cities of Amsterdam,
Rotterdam, Den Haag, Utrecht,
Arnhem and Breda. For more
information about the devel-
opment process and design of
the National Key Projects in the
Netherlands and their future, see
also: Bureau Spoorbouwmeester
(2016) *De Nieuwe Sleutelpro-
jecten. Op weg naar 2030*.