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# Design of Co-creation in Rotterdam Central Station (1996-2007)

## Architecture and urban design roles in the multi-stakeholder collaboration

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### **Abstract**

This article explores the pivotal role of design as a decision-making tool within multi-stakeholder collaborations, focusing on the early phases of the Rotterdam Central Railway Station and its surroundings project. Spanning from 1996, when it gained National Key Project status, to 2007, when construction commenced, this period precedes the preliminary design, during which the design process becomes the primary method of collaboration among multiple stakeholders, including designers and clients involved in the station area's development.

After introducing the post-war reconstruction of the station area and the 'Platform Zero' experiment, this article defines three key stages of design in the initial phase, each of which left a distinct mark on the station project. These stages are:

- From 1996 to 2001: Design for political communication.
- From 2002 to 2004: Parallel design.
- From 2004 to 2007: Design co-creation and integration.

To provide a comprehensive view of the design's development, this article includes insights from conversations with architects and planners engaged in the process. In a dynamic exchange between various stakeholders and designers, the evolution of Rotterdam Central Station's design reveals how political decisions have been informed by thorough design studies, offering a platform for robust discourse on critical issues.

### **Keywords**

mobility, stations as nodes, urban design, architectural research, multi-stakeholders' collaboration, building blocks, co-creation, integrated design

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# 1 Introduction

As in many European cases at the beginning of the 1990s, the city of Rotterdam leveraged the development of the high-speed railway infrastructure (HSR) to enhance its image and urban economy through ambitious plans for the central station area. In 1996, Rotterdam Central Station became one of the six national National Key Projects, encompassing the station buildings and the development of their surrounding areas, directly and indirectly contributing to the construction of the high-speed railway connecting the Netherlands with France and Belgium. The other projects included Amsterdam Zuidas, The Hague New Central, Utrecht Central, Arnhem Central, and Breda Station District. The vision was that improving the public transport network would support Rotterdam's aspiration to reinforce its position on the map of Europe and to serve as a new gateway to Schiphol Airport (Tellinga, 1996).

The construction or renovation of the station and its surroundings constituted a complex urban development task, involving a multitude of expertise, parties, and interests. Government entities, provinces, regions, and municipalities collaborated with designers for several years on these National Key Projects. These initiatives were characterized by long-term planning and a high degree of complexity, requiring designers to engage with multiple stakeholders during various consultation phases. The resulting stations symbolize not only a challenging construction endeavor and the necessary expansion of the station but also a significant enhancement in public transport quality and the development of station areas (Sporbeeld, 2016).

This article delves into the project definition phase of Rotterdam Central Station, aiming to investigate the role of design as a decision-making tool in multi-stakeholder collaborations. It introduces three distinct phases and definitions of design within the stage that precedes the preliminary design of the station building and its surroundings, spanning from 1996 to 2007. The author has had the opportunity to interview key stakeholders involved in the design of Rotterdam Central Station and has accessed archives from the municipality, railway companies, and design offices during doctoral studies. The article's focus lies in analyzing and extracting insights from this specific phase of the project.

## Rotterdam Central Station before 1996

The context of the Rotterdam Central Station area cannot be separated from its rich historical background. Much like the city center, the origins of this area date back to the 19<sup>th</sup> century. Its development was closely tied to the industrialization of the railways. In 1847, the railway connecting Amsterdam to Rotterdam was inaugurated, marking a significant milestone. Later, in 1877, a railway viaduct was constructed, spanning the city and crossing the River Maas.

However, the area underwent substantial changes after the devastation caused by the Second World War, leading to the disappearance of Hofplein, which was the city's main social hub, along with the closure of Delftse Poort station. The year 1953 saw the emergence of the Groothandelsgebouw (Wholesale Building) at the central station area, which stood as the first major urban development project in the city center's revitalization. Simultaneously, the opening of the Weena tunnel and the Hofplein fountain became powerful symbols of post-war rejuvenation.

Further transformations occurred in 1957 when the new Central Station, designed by the architect Van Ravesteyn, was constructed, along with the EKP building on Delftsestraat. However, by the 1960s, the station square was primarily dominated by cars and parking spaces. The immediate surroundings featured a bus station in front of the post office, and the street facing the station, Weena Boulevard, was characterized by an empty square adorned with pavilions (Figure 01).



**FIGURE 1** Rotterdam Central Station area, view on Weena in 1970. Source: Stadsarchief Rotterdam (Rotterdam City Archive) NL-RtSA\_4282\_1970-514 (digital image)

### Platform Zero

The construction of the underground metro line, leading from Central Station beneath Weena to Coolsingel, was completed in 1968. Simultaneously, a railway line connecting the station to the national airport was also established. This new railway connection rendered the previous bus link between the station and Schiphol Airport unnecessary. Consequently, other bus lines shifted their stops from Central Station to Zuidplein, where the first metro station was also constructed.

The rapid decrease in the number of buses led to the closure of the bus station on the east side of the station during the 1980s. This vacant space soon attracted drug users, homeless individuals, and alcoholics, transforming the station square into an unsafe place. The situation was vividly described by Pastor Visser of the Church St. Paul in his book, *"Platform Zero, Rise, and Fall"* (in Dutch, *"Perron Nul, Opkomst en Ondergang"*). In response to these challenges, Pastor Visser established a shelter at the location of the former bus station, called 'Platform Zero,' providing a space for people to gather and receive support. The shelter officially opened on March 31, 1987, offering an alternative to the station itself. Unfortunately, the shelter attracted a large number of addicts, including individuals from abroad. Disturbances and incidents were a common occurrence at Platform Zero, and in 1992, the project had to relocate to the west side of the station due to a significant altercation between hundreds of marines and the addicts on the station square (Figure 02).

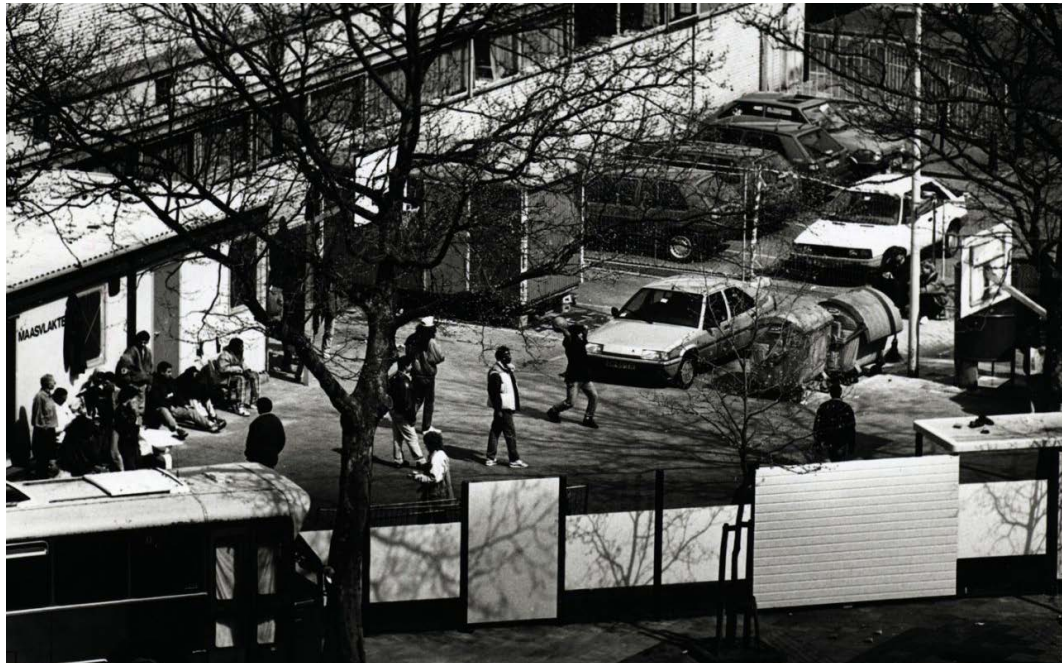


FIGURE 2 Platform Zero in 1992. Source: <https://www.mariniersmuseum.nl/nl/de-slag-om-perron-nul/>

In 1994, 'Platform Zero' was closed by the mayor of Rotterdam, Bram Peper, and Pastor Visser continued his support at the Church of St. Paul. Following this closure, the Central Station area remained car-dominated, unfriendly, and unsafe. During this period, the city had different priorities on its agenda, and the social challenges stemming from the Platform Zero experiment, such as the issues with drug users, homeless individuals, and alcoholics, were not the primary focus. The city was focusing on developing its harbor and becoming the first city in the Netherlands with its own metro.

In 1991, the Rotterdam City Council organized a trip to Lille to visit the newly built HSR station Lille Europe and the station area development project known as Euralille, designed by the Dutch architect Rem Koolhaas. The aim of this visit was to draw inspiration from this large-scale masterplan, which featured high-rise buildings alongside infrastructural development (Figure 03). In 1993, with the construction of the tunnel over the River Maas, replacing the railway viaduct, the city's vision for a renewed central station was combined with plans for high-rise developments that could run perpendicular to the railway tracks. This served as a precursor to a masterplan by the National Railways (NS). It's highly likely that Euralille served as a reference point for both the redevelopment of Kop van Zuid (the former harbor area), a part of the 1<sup>st</sup> generation of Key Projects, and the new ambitions for Rotterdam Central Station, which belonged to the 2<sup>nd</sup> generation of Key Projects, known as Nieuwe Sleutelprojecten (NSP) in Dutch. The NSP can be likened to the French *Grand Projets*, adapted to the Dutch context (Triggianese, 2015).





## 2 The design process of Rotterdam Central Station: steps and design roles

### Step 1: 1996- 2001

With the advent of the HSL and RandstadRail, a tram system connecting Rotterdam and The Hague, the demand to enhance the capacity of Rotterdam Central Station to accommodate a growing number of passengers has become paramount, with an estimated 320,000 passengers expected in 2025.

In 1998, a report titled “*Rotterdam Central Station, Exploration of the Program*” (in Dutch, “*Rotterdam CS, Verkenning van het Programma*”) recognized numerous urban possibilities for creating an appealing blend of residential, commercial, and entertainment spaces in the vicinity of Central Station. This report was a collaborative effort, compiled by representatives from several key entities, including the Rotterdam City Development Corporation (OBR), a public-private partnership actively engaged in land development on behalf of the municipality since the early 1980s. The report also involved the department of Spatial Planning and Housing (dS+V), the Ministries of Housing, Spatial Planning and the Environment, and Economic Affairs, as well as the National Railways organization for stations and station area development (NS Vastgoed and NS Stations). Within this vision, the station was envisioned as an inner city transport terminal.

To ensure accessibility to this terminal, an ambitious plan was crafted. This plan included a 3,000-car garage constructed above the tracks, complemented by 30 acres of entertainment facilities, 60 acres of office space, and 1,000 housing units. A focus group was formed, comprising representatives from various parties and real estate companies with vested interests in the station area, including prominent names such as ING, Amvest, and Rodamco.

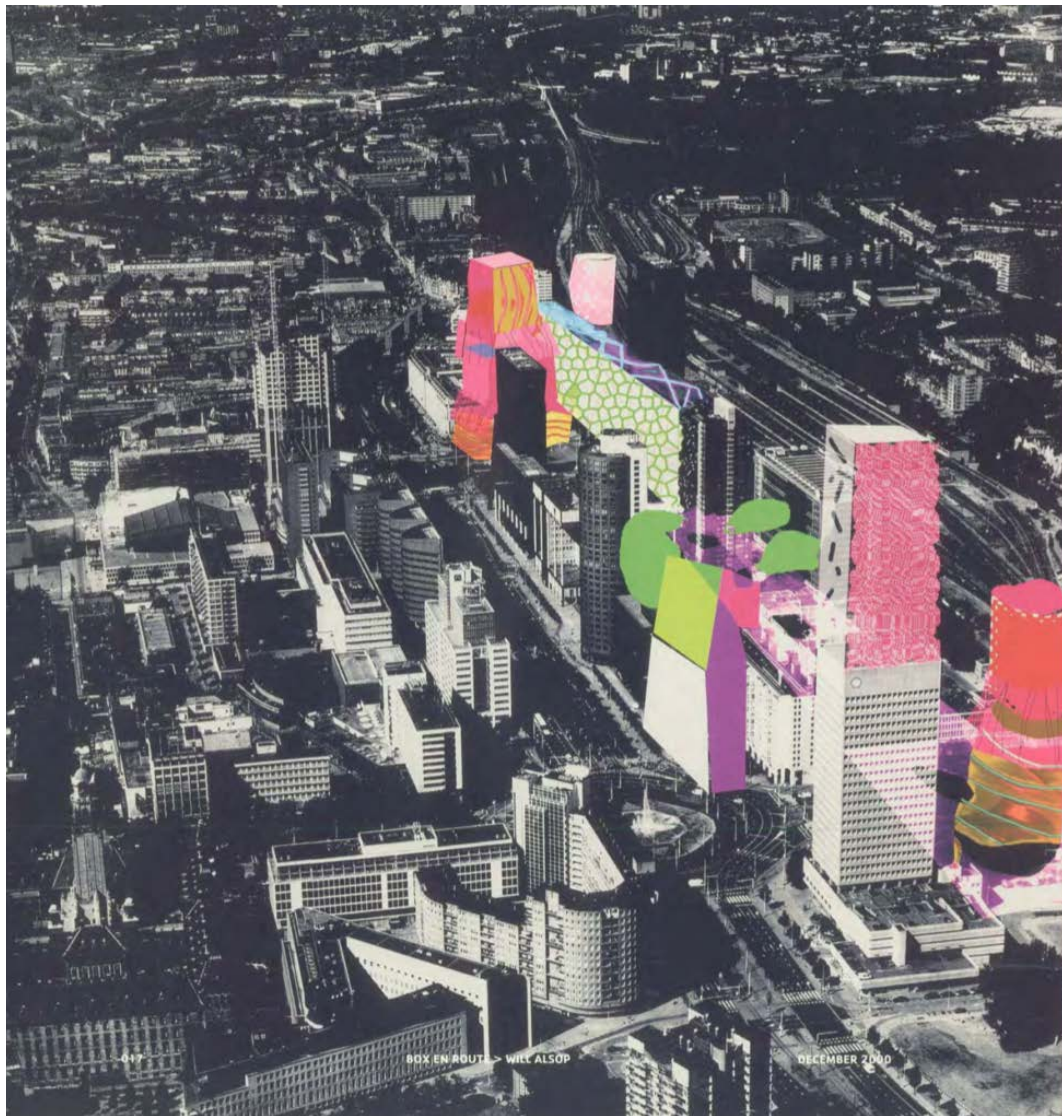
### 2.1 Design for political propaganda

The design process for the Rotterdam Central Station area underwent several phases, each marked by distinct challenges and shifts in focus.

In its early stages, the design aimed to attract new investors and serve as a political propaganda instrument, albeit with limited attention to the complex social and urban factors in the Rotterdam Central Station area. This followed the ‘Platform Zero’ experiment, emphasizing the significance of urban leisure and entertainment facilities as part of the envisioned redevelopment.

In 2000, a development program was established, leading to invitations extended to six international architects, including Rem Koolhaas (OMA), Joan Busquets, Skidmore Owings Merrill (SOM), Norman Foster, Santiago Calatrava, and the British architect William Alsop. In 2001, the city selected and presented William Alsop’s master plan for the Central Station area, referred to as the “Champagne Glasses,” with a specific focus on culture and leisure as a marketing tool (Figure 04). This collaborative effort involved various entities, such as the Rotterdam City Development Corporation (OBR), the department of Spatial Planning and Housing (dS+V), ministries of Housing, Spatial Planning and the Environment, and Economic Affairs, along with the National Railways organization for station and station area development (NS Vastgoed and NS Stations).





**FIGURE 4** Alsup's masterplan Rotterdam Central Station District. Source: <https://newsbeezer.com/netherlandseng/in-memori-am-will-alsop-1947-2018/>

However, a shifting political climate, marked by the transition from the Labour Party's long-running rule to Leefbaar Rotterdam's victory in the council elections under the leadership of Pim Fortuyn, led to a reevaluation of Alsup's master plan. In this new context, Alsup's ambitious and costly vision was considered unfeasible and ultimately rejected by the newly elected government. Consequently, the local authorities initially narrowed their focus to the station building itself.

The design of the terminal, or the *Mobility Hub*, as envisioned by Alsup, was analyzed in depth but deemed too complex and inefficient for the *modal split*, given the different modes of transport stacked atop one another (tram, bus, train, metro, bike, pedestrians, car). Subsequently, the project area for the station in Alsup's plan was initially extended to Hofplein but eventually reduced to the station building and its immediate surroundings. Only when it became evident that intervention in the broader area was necessary did adjacent stakeholders, including major multinationals like Nationale Nederlanden/ING and Unilever, as well as smaller creative companies, become part of the project's plans.

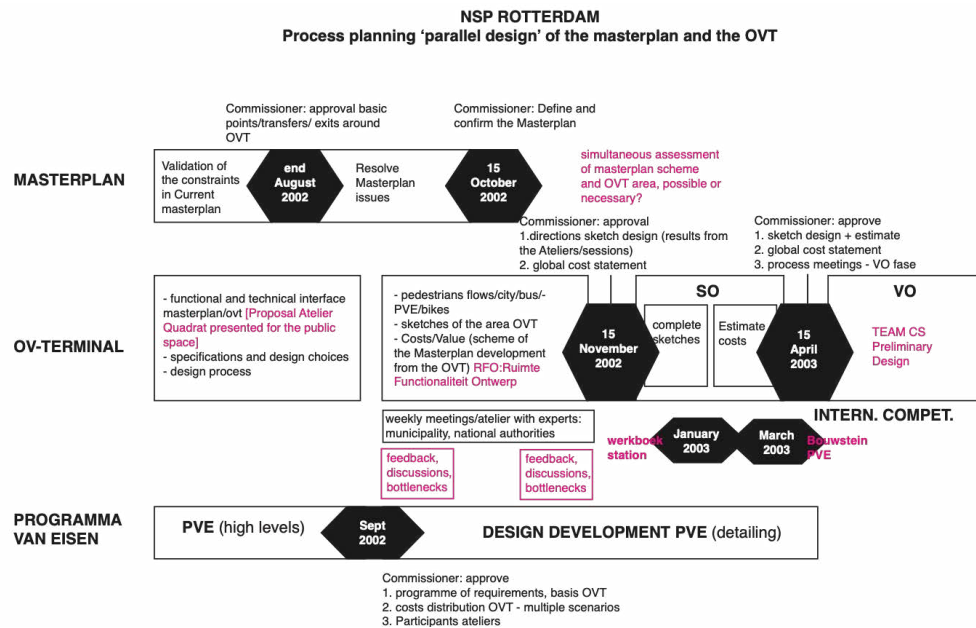
This first phase culminated in a redefined and more localized focus, shifting from the grand vision of the 'Champagne Glasses' to a concentrated approach centered on the immediate station area.



## Step 2: 2002- 2004

The second step, commencing in 2002 and spanning through 2004, introduced a novel working methodology where all involved parties aimed to precisely determine their needs. A series of workshops coordinated by Holland Rail Consultant and various actors led to a new strategy, adopting a 'building blocks' approach. In this redesigned setup, the City, Dutch Rail, the city region of Rotterdam, and the involved ministries assumed responsibility for the new strategic plan. Ambitious development goals were significantly scaled down within a newly defined project area (400,000 square meters of Gross Floor Area) with adjusted cost estimates (totaling €400 million).

This phase ushered in a new era for the project, marked by an extensive series of meetings and workshops, involving governmental parties and the Dutch Rail infrastructure company (ProRail/Holland Rail Consultant). Atelier Quadrat, working alongside ProRail and the City's representatives, embarked on the next phase of development for the Public Transport Terminal. Beginning with an exploration of the program, this phase entailed the development of numerous variables, driven by Atelier Quadrat, as commissioned by the Municipality on the City's side, with Holland Rail Consult and ProRail representing the Station's interests. A process planning was outlined by the Railway parties, indicating parallel design processes for the masterplan and the public transport terminal (OV terminal), aimed at defining the Program of Requirements (Programma van Eisen) (Figure 05).



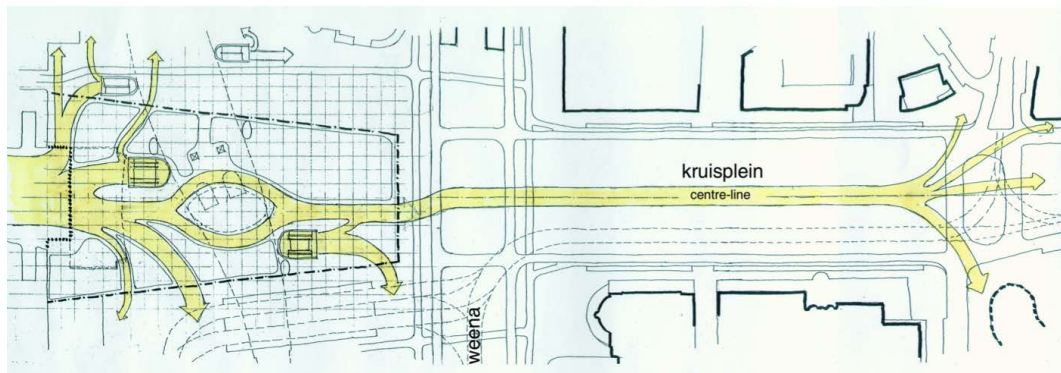
**FIGURE 5** The scheme indicates the process planning of the 'parallel design' of the masterplan and the public transport terminal for the National Key Project Rotterdam Central Station. It is based on documents provided by Johan Meijer (ProRail) in 2015. Image author: Manuela Triggianese.

## 2.2 Parallel Design

During a four to five-month workshop involving local stakeholders, property owners, NS, ProRail, and the City, design results were extensively discussed. This phase included a bi-weekly design team, featuring consultants, users, and delegates, culminating in the formulation of several possible scenarios that

contributed to the development of ideas for the upcoming design competition for the new central station. The primary theme under scrutiny was the character of *intermodality* within the station, with a key concern being the potential conflicts at the intersection of various modes of transportation, including trains, trams, metro, and city traffic. Additionally, considerations extended to travelers' facilities and supplementary services. Notably, part of the commercial program was envisioned to occupy two levels (metro and train) in passageways, while accommodating up to 7,000 bikes with the possibility of expansion to 10,500 spaces. To facilitate pedestrian flows and maintain sightlines, two models were proposed during the workshops: one advocating the retention of the current station building, in line with the preferences of Quadrat and ProRail, and another proposing the renewal of the hub.

This development phase culminated in the creation of the Spatial Functional Design (RFO), which served as the foundation for a new design for Rotterdam Central Station. The RFO included elements such as possible ProRail developments, the translation of specifications into a blueprint and sector plan (vlekkenplan), elaboration of specific scenarios with cost estimates and reference images (elevations, facades, concept design). These scenarios, along with their associated budgets, encompassed interventions at the station level, city level, transportation, and urban design. The RFO then evolved into the project brief (Bouwstenen voor het Programma van Eisen) for the International Competition of the New Central Station in 2003.



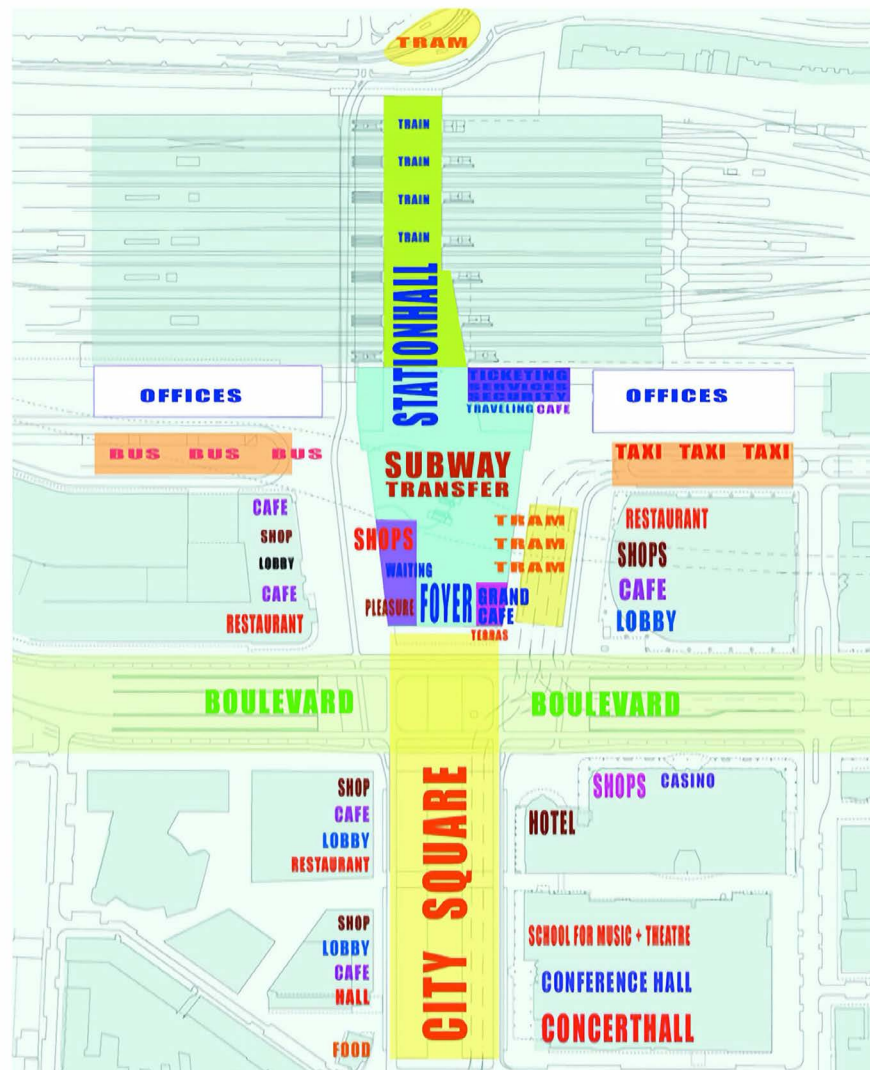
**FIGURE 6** Pedestrian connection from the station to the city center, sketch included in Rotterdam Central Station Vision, 2003 © ProRail \ Holland Rail Consult and Atelier Quadrat

### Step 3: 2004 – 2007 Era of Co-creation Design of the Terminal

In the subsequent era of co-creation, from 2004 to 2007, the design of the terminal took center stage. Team CS, comprised of Benthem Crouwel Architects, MVSA Meyer en Van Schooten Architecten, and landscape firm West 8, was selected from among other architectural firms. Their responsibility encompassed the (re) design of the station, exterior spaces, and entrances to the subway, kiss-and-ride facilities, and Kruisplein parking. A key objective was to integrate both entrances within the station building, prominently facing Weena boulevard (Figure 06). With the existing track positions and the metro in mind, Team CS endeavored to fulfill the City's vision of harmonizing subway entrances within the station building, extending the expansive roof over the plaza. This design aimed to foster seamless connections between the metro, tram, and buses, envisioning a canopy as a unified roof, eliminating the need for individual canopies above various platforms, all while providing a clear view of the city. The station's interior path, expanded from 8 meters to 50 meters, would host businesses and guide travelers to a direct view of the trains. This design philosophy embraced ample natural light through voids in staircases and the roof's transparency. Furthermore, a footbridge was constructed above the tracks on the station's west side, serving both as a transit pathway and an emergency escape route.

The station, or hub, was designed to accommodate transit passenger flows, commercial spaces, waiting areas, recreational facilities, offices, and parking for cars and bikes (Figure 07). Team CS followed the Building Blocks Approach, as illustrated in the Spatial Functional Design, uniting the seven involved parties in the decision-making process. Instead of constructing everything atop one another, as in the Alsop design, Team CS opted for a simplified structure for the central station. It aimed to enable critical separations at various points in the project, encompassing public and private properties. The architectural vision was centered on a single, unifying roof that connected tracks and waiting platforms, creating a large square where diverse needs for space and services could be met.

Simultaneously with the design of the hub, Team CS conducted a series of urban studies for the area surrounding the station. In 2007, Maxwan designers collaborated with the City to explore the transformation of the station's environs. The concepts of dual access from the north and south, and the distinction in urban character between Provenierswijk to the north and the high-rise center to the south, were pivotal aspects of this exploration.



**FIGURE 7** Program distribution and the building block approach, included in the Bouwstenen voor het programma van Eisen, 2003 © ProRail\ Holland Rail Consult and Atelier Quadrat



## 2.3 A conversation with Jan Benthem

The development of the area around Rotterdam Central Station was a fundamental component of the overall project, with the station itself being the largest and most complex building block. The construction of the station terminal involved numerous parties, adding to the incredible complexity of the project. Notably, the station terminal was divided into two distinct domains: a 'railway side domain' and a 'city side domain,' each overseen by a different entity. The Ministry of Transport, Public Works, and Water Management was responsible for the railway section, while the city section fell under the jurisdiction of the Rotterdam city council.

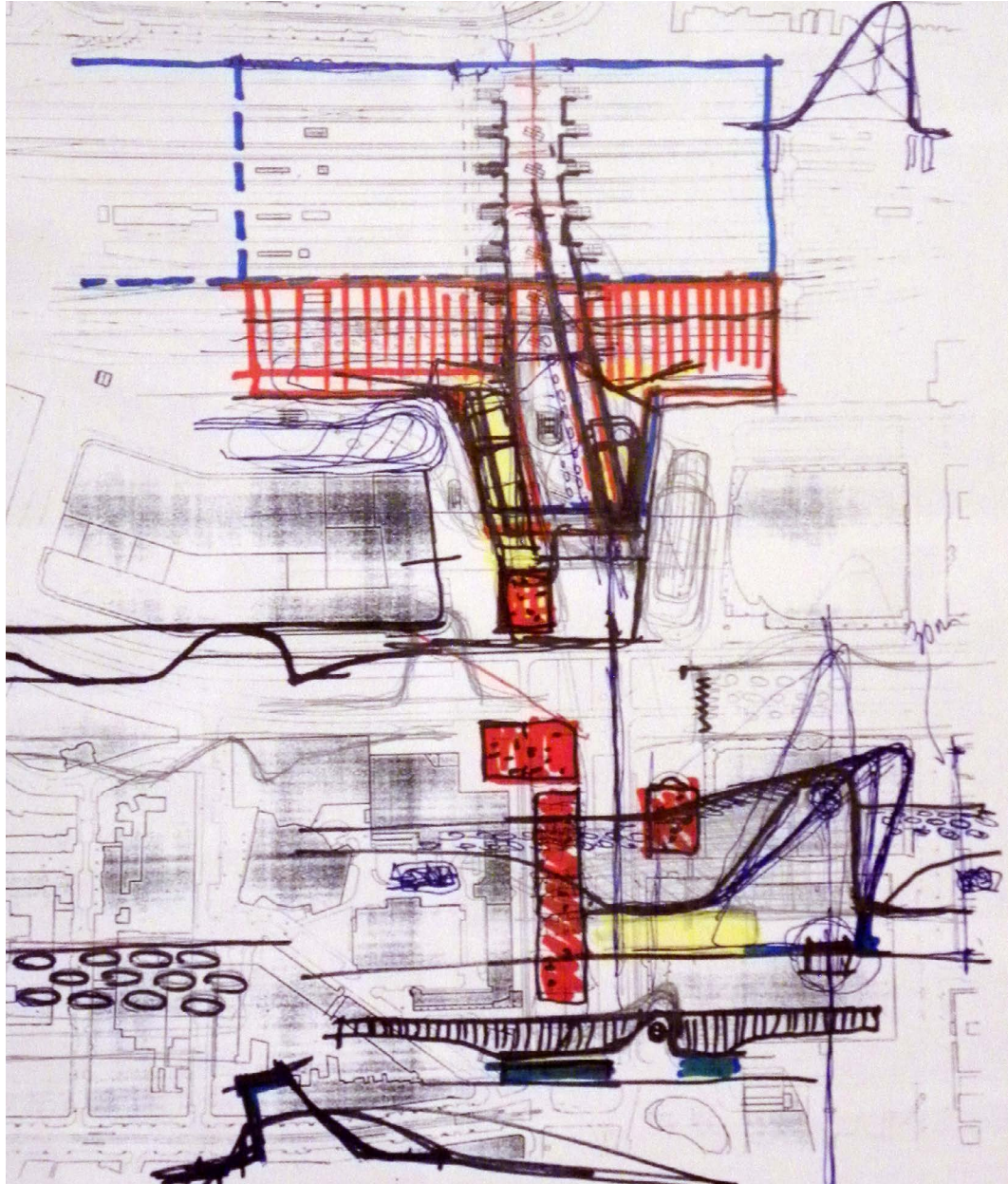


FIGURE 8 Sketch Rotterdam Central Station, 2003 image courtesy © Benthem Crouwel Architects

Jan Benthem, the project leader at Team CS and founder of Benthem Crouwel Architects, shed light on the intricacies of the project in an interview. He emphasized the need for collaboration among different owners and clients, each operating within their specific budgets and targets. Benthem explained that this collaboration could only be successful if each client could make decisions within their domain and budget. To illustrate the complexity, he noted that building one large roof was not feasible within Prorail's budget constraints. With a standard budget, there were resources available only for individual canopies on the platforms. Benthem's experience taught him that initiating the process was the key, as decisions could lead to problem-solving, rather than attempting to solve all the problems at once at the project's outset.

The station's construction reflected the division between the two owners, with the municipality and Prorail each responsible for different sections, utilizing distinct contractors and methods for development. Benthem described the project as more akin to urban design than architecture, with the design playing a pivotal role in facilitating the process and adjusting the initial brief. He highlighted the unique challenges in such large-scale projects, where traditional architectural aspects were not the primary concern. Instead, the primary focus was on the decision-making process and how the architect could influence decisions, playing a crucial role in that regard.

Benthem emphasized that in these projects, effective communication was essential since various parties had different languages and expertise. The architect had to collaborate with a substantial team of engineers and designers, necessitating a fundamental understanding of their respective fields. This understanding empowered the architect to contribute effectively to the decision-making process. Benthem explained that for such projects, the process followed a similar trajectory as traditional building projects, beginning with a preliminary design. However, the key difference was that the problem definition for the site was not always predetermined.

In conventional projects, there is a program of requirements (the brief), which serves as a clear starting point for design. In the case of Rotterdam Central Station, the brief was either unclear or flexible, making the role of the preliminary design crucial in helping the involved parties define the project's requirements. Benthem noted that local owners responsible for the station frequently visited their office, engaging in regular two-hour sessions every two weeks to discuss schemes and designs. This intensive collaboration occurred around five to six times during the preliminary design phase.

## **2.4 Rotterdam Central Station Masterplan**

In 2006, urban studies were initiated around the area surrounding Rotterdam Central Station, spurred by local stakeholders' interests. The catalyst for these studies was the research conducted on Delftseplein by the Dutch team KAAAN Architecten, known at that time as Claus en Kaan in Rotterdam. These studies aimed to rekindle the original ambition of the Rotterdam Central Station project as conceived by the Central Government in 1990. They sought to assess its feasibility by engaging local designers and stakeholders.

Nearly two years after the completion of the design for the new station in 2007, the possibilities for constructing offices and residences in the immediate vicinity of the station were thoroughly mapped out. Concire's special team compiled the foundational agreement document titled 'Weena | Glocal City District.' This document laid the groundwork for productive discussions among all involved parties, using the term 'glocal' to encapsulate the area's versatility, ranging from globally operating companies to local entrepreneurs.

The Rotterdam Central District Association was established, uniting key stakeholders with the objective of generating interest in the area as a prime business location. In 2007, the Municipality entered into an agreement with several prominent players in the area, including Unilever, ING, Groot Handelsgebouw, LSI Project Investment, and Maarseen Groep. The agreement emerged from a series of meetings with local stakeholders, municipal representatives, and experts, aimed at devising an effective strategy for the station neighborhood.

A new urban development plan was crafted by Maxwan architects and urbanists, in collaboration with the department of Spatial Planning and Housing (dV+S), aligning with the 'glocal' concept that had evolved from the intensive discussions. This plan incorporated a 'mixone' approach, enhancing the outdoor spaces and street levels, essentially transforming the area's 'groundscraper' buildings. Subsequently, efforts were directed toward establishing an association, the Vereniging Rotterdam Central District, with the goal of enlisting as many entrepreneurs from the station quarter as possible. Major sponsors of this association included the city of Rotterdam, project developers LSI and Bouwinvest, LNG Real Estate, and Maarsen Groep.

Since 2007, there has been unwavering support for reconfiguring the station and enhancing its intermodality through numerous real estate projects in the surrounding area. This support has been championed by the Dutch Railways, the Municipality, and local investors. The Maxwan master plan evolved in tandem with property developers' scenarios for potential buildings, led by local architects and planners. It became evident that beyond their role as designers, architects played a crucial part in identifying, presenting, and communicating interests, significantly influencing the trajectory of the entire process. In the context of the slow decision-making process and the interplay of local and national politics, characterized by well-defined ambitions, the (re)design of the Rotterdam Central Station area, known as the Central District, consistently adapted and transformed, evolving into a vibrant urban hub.



FIGURE 9 Rotterdam Central station after completion.



### 3 Conclusions

The realization of the station hub has played a pivotal role in an intriguing process of urban regeneration, giving rise to the current Rotterdam Central District (RCD). This district serves as a gateway to the heart of the city skyline and its bustling harbor. The combination of multimodal accessibility and the potential to concentrate urban functions around the central station has presented an exceptional opportunity to cultivate valuable spaces within the city of Rotterdam.

Reflecting on the design and planning of Rotterdam Central Station, this case study offers insights into the challenges faced when ambitious large-scale master plans are employed primarily for political propaganda and when new procedures are introduced to make design a tool for co-creation and integration. Engaging in a dialogue with Jan Benthem, it becomes evident how the station hub's multidimensional character takes shape, not only concerning the physical space and relationships among diverse urban functions but also in terms of stakeholder management and the ongoing dialogue between clients and designers. This collaboration operates on the basis of a flexible and adaptable plan.

This paper delves into the complexities of the station project by examining the initiative phase of the process, recognizing it as a crucial step in shaping the design of a station and its surroundings. It aims to identify the significance of a design that prioritizes "flexibility over rigidity" and sheds light on the use of design methodology as an instrumental tool within the iterative design process of negotiation.

#### List of abbreviations

Abbreviation	Original full text	English full text
NS	Nederlandse Spoorwegen	Dutch Railways
PRORAIL		Dutch Railways maintenance organization (separate company from NS)
CS	Centraal Station	Central Railway Station
OBR	Ontwikkelingsbedrijf Rotterdam	Rotterdam City Development Corporation
RFO	Ruimtelijk Functioneel Ontwerp	Spatial Functional Design
OV	Openbaar Vervoer	Public Transportation
GFA		Gross Floor Area
NSP	Nieuwe Sleutel Projecten	New Key Projects

TABLE 1 Abbreviations

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