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Publication date

2025

Document Version

Final published version

Published in

ISUP Papers

Citation (APA)

Hein, C. M. (2025). The Global Petroleumscape of the Rotterdam–The Hague Area as a Model for Further Research. *ISUP Papers*, (1B).

Important note

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The Global Petroleumscape of the Rotterdam–The Hague Area
as a Model for Further Research
Carola Hein

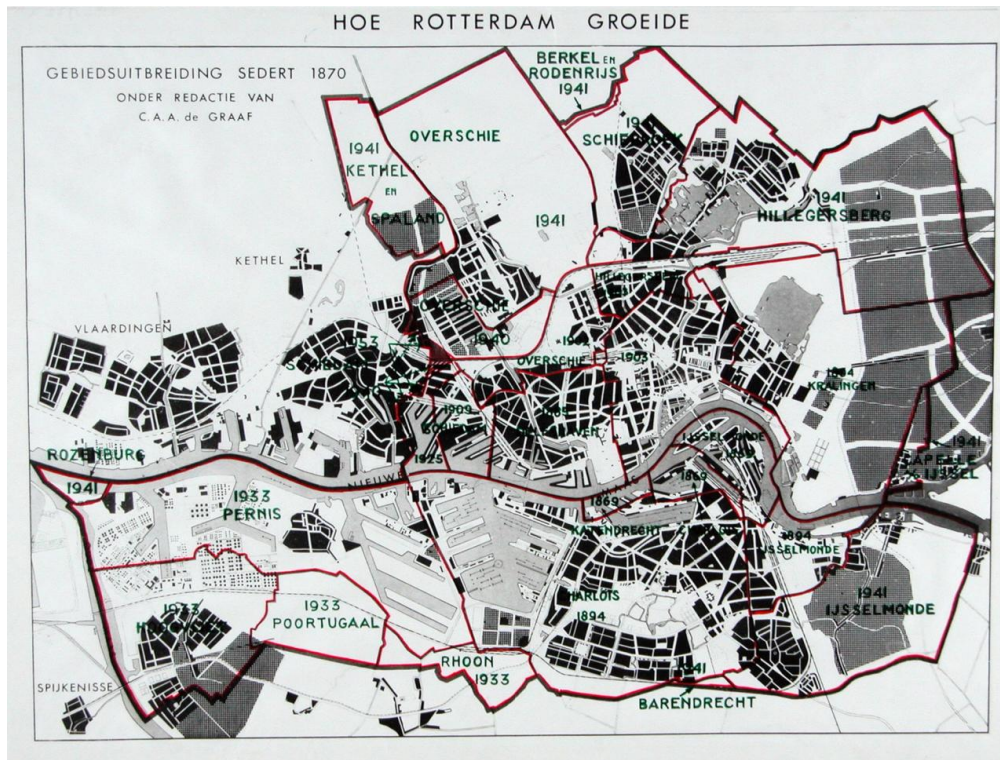


View under the Shell building towards Hofplein station, Rotterdam, 1960. Collection of Stadsarchief Rotterdam (SAR), 4409, 4121

The seemingly endless availability of energy of the twentieth century resulted in extensive sprawl, as people left cities for the suburbs and as companies expanded their production lines around the world. Since this time, shipping and other cheap forms of mobility have led to increasingly spread-out settlement and energy distribution patterns. The emergence of global petroleum networks between producers and consumers around the world has played a significant role in the design and development of shipping, transportation, the urbanisation of the sea and in the construction of new land-side structures. Moreover, the use of petroleum as fuel for the military since the early twentieth century has helped drive the growth of maritime empires, such as Britain's control of Iranian petroleum. For some 150 years petroleum has floated on oil, allowing ports, cities and regions of the world to thrive on that very mixture.

The landscapes around the North Sea, connected by sea to a flexible maritime foreland, are exemplary of a shipping-based petroleum network. More specifically, the historic development of ports and cities in the Amsterdam-Rotterdam-Antwerp area offers an example for the opportunities for port cities due to the particularities of the sea, its industrial exploitation and constructed blankness.¹ Amsterdam, as home for refined petroleum products, Rotterdam, the centre for crude and, crossing the Belgian border to the south, Antwerp, as the second-largest petrochemical industrial complex in the world (after Houston), have emerged as major entrance gates to the hinterland, notably the German Ruhr area.

Beyond the construction of oil production spaces, the land-side development includes administration offices and spaces for the consumption of petroleum products. Once established, these spaces of oil are not only places of production, but as Henri Lefebvre argued, 'also a means of control, and hence of domination, of power'.² Spatial practices (the life of inhabitants in a space on sea or land) and representations of space (the approaches of built environment professionals and other actors) intersect with spaces of representation (the images and associations of the users);³ they are multiple (palimpsestic) layers of physical space and professional and public representation. Together the physical, represented and everyday practices form what I call the *global palimpsestic petroleumscape*.⁴ Each of these layers has similar functions and typologies (style, location or architectural form) and interconnects to form a single landscape. The concept of the petroleumscape starts with the insight that the diverse spatial emanations of oil – including offshore platforms and pipelines, refineries and storage sites, office buildings and gas stations – are connected through their relation to this single commodity and its group of industrial players. Connecting the actual places where oil is transported, stored, refined or even administered with the representation of these spaces and practices involving petroleum products enables a better understanding of the ways in which oil shapes behaviours and secures continuous demand.



Map of Rotterdam, showing the extensions to its territory from 1870 to 1941, with the years in which the relevant laws were passed. Adapted by C A A de Graaf, Rotterdam Department of Public Works. Collection of Stadsarchief Rotterdam (SAR), 1968-1722A, 4001

Black Gold in the Dutch Randstad: Establishing Rotterdam as a Hub for Global Petroleum Flows, 1862-1910

While Antwerp was initially the biggest importer of petroleum from the United States, in the last 150 years Rotterdam has emerged as the main petroleum hub. In Rotterdam and in other cities around the world, it became clear early on that oil – a highly flammable and harmful substance – required special storage away from structures that could easily be destroyed by fire and from the city's supply of drinking water. Ensuring that transportation to and from the port was another challenge. The construction of water, rail and road infrastructure at a national scale and the extension of the city borders became key factors in the development of the Rotterdam port, and in turn these infrastructures facilitated petroleum trade. The construction of new infrastructure, including the opening of the shipping canal, the Nieuwe Waterweg in 1872, and the growth of the city on the sea-land continuum created the foundation for Rotterdam's development as an oil node just as new global players in oil entered the European market. At the end of the nineteenth century, these players were interested in the port of Rotterdam as a turntable and transit point for oil on its way to the rapidly industrialising areas in western Germany. By 1891, several major oil companies had settled in the port, and by 1901, the Koninklijke Olie – one of the predecessors of Royal Dutch Shell – had built there as well. The advent of major companies that gained control of the entire production and distribution chain – one that was mostly maritime-based – had extensively reshaped the port and the oil business. Their interests and commodity flows connected various parts of the world, putting their imprint also on the Randstad. If demand for lighting oil established Rotterdam as a major oil port, the rapidly growing new demand for benzene as a car fuel triggered its explosive growth. The construction of refineries related directly to the needs of petroleum produced abroad: including a trial distillation facility for petroleum from Borneo in 1907, and a trial facility for asphalt in 1918. The multinational setup of companies, such as Royal Dutch Shell, required close contact between different headquarters in the Netherlands and the United Kingdom and also had an impact on travel across the North Sea. In parallel with the infrastructure created for oil itself,

newly emerging aerial connections facilitated the travel of decision-makers among different sites and facilities. The Waalhaven Airport, located in the Rotterdam port next to the oil facilities, opened in 1920 and allowed companies to bring in executives from London as the oil trade expanded.⁵

Pre-war development of oil infrastructures in the port and the capital city had a major impact on postwar rebuilding of bombed-out Rotterdam, illustrating the importance of the path dependencies of oil. In May 1940, on the eve of the Rotterdam Blitz, The Hague was known as the petroleum administration headquarters and Rotterdam was the third-largest port in the world after New York and London, and a major entrance gate from the North Sea to the European continent.⁶ The port city's leading role in petroleum storage and refining made it a target during the Second World War, and the existence of industrial oil structures in the port of Rotterdam was a major factor in establishing a continuity of oil transportation and transformation even as production centres shifted in the postwar era.

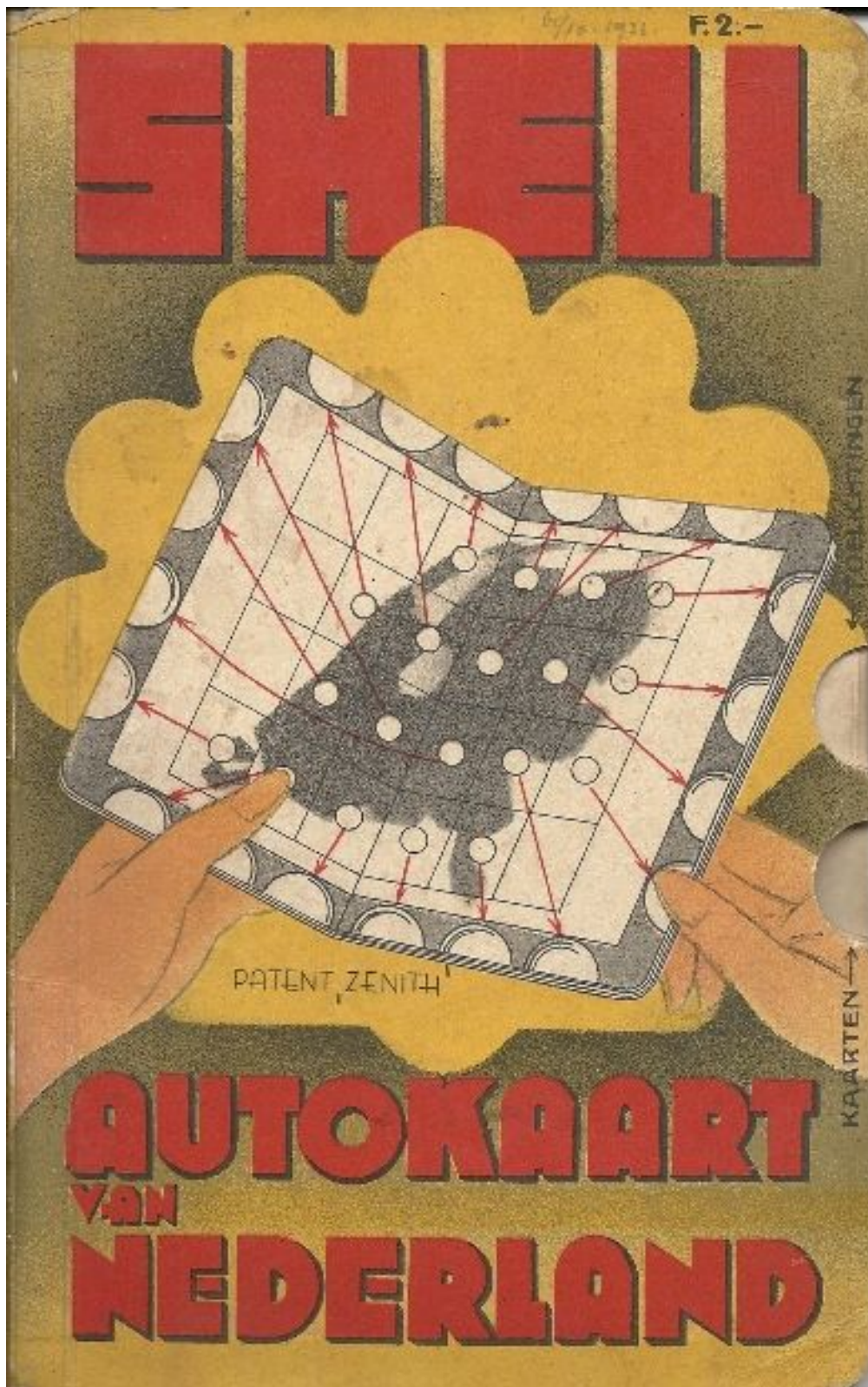


Aerial view of the digging of the second Petroleumhaven, from the northeast, Rotterdam, 1946.
Collection of Stadsarchief Rotterdam (SAR), VII-450-01-02-3, 4232

In the early 1960s, with decolonisation in Asia and Africa, most of the oil started coming from the Middle East, and the flexible maritime foreland put Rotterdam in contact with global oil producers. The key role of Rotterdam as a petroleum hub was consolidated through a number of projects including: the building of structures beyond the port and the expansion of the cities of the Randstad, the development of the Dutch highway network in conjunction with the construction of new gas stations alongside them, the rapid growth of traffic, the increasing number of headquarters and research institutions in The Hague, and in neighbouring Delft and Zoetermeer; and the construction of the Shell Tower on Weena in Rotterdam, part of the reconstruction effort.

The oil industry's need for access to the port and its hinterland continued to play a role in planning and land allocation in the Rotterdam area, and several studies document the overlapping interests of Shell and the Rotterdam Port Authority. By the 1950s, the consumer had become an important participant in the petroleumscape. Shell publicity promoted the use of its products, highlighting freedom of travel and the beauty of historical landscapes. The company produced and handed out many promotional documents – maps, brochures and booklets – that focus on features of

the Dutch landscape. Maps can be powerful tools to help users understand space, but they can also create imagined new geographies, and corporations have used them for this purpose for decades.² Throughout the twentieth century, oil companies sold or freely distributed road maps that tied the company name to the experience of driving and visiting. The covers of these maps tie company colours and logos to traditional landscapes, to tourist destinations, to historical, scientific or cultural explorations.⁸



The 'Shell Atlas', c 1931. Source:
<http://www.petroldmaps.co.uk/country/maps-nl.htm>

Company publications geared at the general public continued to construct an imagined landscape different from the one that they were actually building: their focus remains on accessibility of select natural, historical and cultural spaces that are primarily on a national and terrestrial scale, excluding the maritime spaces that served as industrial extensions. While the representational petroleumscape constructs space and identity as well as culture in and for spaces far beyond the ones it actually occupies, it largely ignored the necessity of shipping. For the general public, these publications constructed a feedback loop that tied petroleum actors to the freedom of driving across the land and the joy of leisure.

The oil crises of the 1970s, when major industrial countries faced oil shortages, could have challenged the prominent role of petroleum actors in shaping the built environment. Car-free Sundays in the Netherlands allowed citizens to reclaim highways. The memory of the public was short, however, and few long-lasting changes occurred. By that time, Rotterdam was firmly established as a leading oil port, serving consumers notably in the German hinterland.

Today, the production sector is huge in scale, with some 5,300ha for industrial sites and 1,500km of pipelines within the port. Its impact on planning decisions is great, but its visibility to the general public has traditionally been marginal.⁹ The pipeline network that links Rotterdam with Antwerp (where big ships can no longer dock and where the petrochemical industry needs petroleum), and also with Germany is largely out of sight.¹⁰ In addition, oil companies share other parts of the infrastructure, such as important rail and highway networks, with general users, who do not easily identify these infrastructures as part of the oil networks. Changes in the refining business will affect ports, cities and transportation infrastructure, and those entities will have to formulate planning strategies in response. As refineries and storage areas around the North Sea disappear, they will require extensive and specialised cleanup, but even then, the refineries will be difficult to integrate into their neighbouring cities: they will remain valuable to the oil industry due to the extensive specialised networks they are integrated within and that continue being used.

This history shows that the oil industry, in close collaboration with national governments, has materially not only shaped the port and its links to the sea, but the entire Randstad and its hinterland, through company headquarters, retail, infrastructure and ancillary buildings. Using the petroleumscape as an analytical lens allows for a multidisciplinary investigation of planetary urbanisation as well, allowing us to transcend disciplinary and sectorial borders to unpack entanglements and relations that cross maritime spaces, and to develop new design approaches that include not only land-based, but also sea-based, spaces and that recognise the viscous nature of the territories at the edge between land and water.

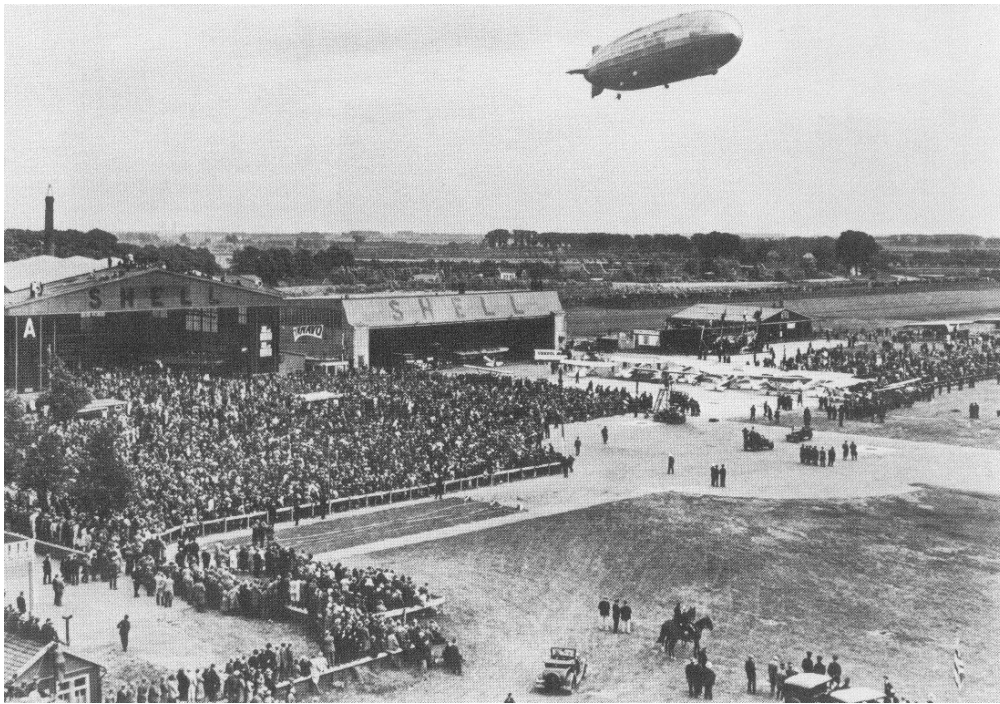
Citizens and politicians must gain an awareness of the enormous scale of oil's presence and its representation in order to support new energy values in line with a post-oil society, and to create new imaginaries of that post-oil life. We need to recognise the importance of the built environment and its representation (whether established through petroleum or not) in the construction of power systems. A single but world-encompassing industry has created path dependencies in multiple nations and locations; that is, the long lifespan of built things perpetuates oil dependency. This industry continues to shape our value systems, imaginaries and decision making. All of this makes it particularly difficult for societies to overcome oil dependency and promote new energy practices.

Dominic Boyer and Imre Szeman argued in a 2014 article, 'The Rise of Energy Humanities,' that 'today's energy and environmental dilemmas are fundamentally problems of ethics, habits, values, institutions, belief and power'.¹¹ They also argue that the failure to imagine new solutions is partly due to a lack of understanding of how oil works in culture.¹² Studying the spatial and representational layers of the petroleumscape can help us take on the many challenges in replacing them, including cleaning and redeveloping polluted areas, redeveloping and reimagining former oil sites, developing and preserving infrastructure (such as highways) from the oil age, rethinking gas stations and headquarters, and designing new sustainable spaces with as ubiquitous and with as strong an affective character as the spaces of oil.

If the represented layer of the petroleumscape influences how people generate a new physical petroleumscape and its buildings and urban forms, then this inclusive approach to oil is fundamental not only to any rethinking of energy usage and sustainable architecture, but also to breaking down the feedback loop.¹³ Changing it is perhaps the second step (after understanding history) in creating fossil-free energy landscapes. We also need to generate new imaginaries of fossil-free technologies, images and practices that allow the general public to embrace these technologies and create new landscapes. Architectural and urban design can help implement such changes. After all, traditional windmills and canals were also originally engineering devices and have now become part of the national imagination. Couldn't we achieve the same for new technologies?

Carola Hein is Professor History of Architecture and Urban Planning at Delft University of Technology, Professor at Leiden and Erasmus universities, and director of the Leiden-Delft-Erasmus PortCityFutures Centre. She holds the UNESCO Chair of Water, Ports and Historic Cities. She has published widely in the field of architectural, urban and planning history, bringing together historical analysis with contemporary development. Her recent edited and co-edited books include: *Hustle and Bustle of Port Cities* (2025), *Port City Atlas* (2023), *Oil Spaces* (2021), *Urbanisation of the Sea* (2020), *Adaptive Strategies for Water Heritage* (2020) and *The Routledge Planning History Handbook* (2018).

1. This text is a shortened version of Carola Hein, 'The Global Petroleumscape of the Rotterdam/The Hague Area: as a Model for Further Research', in *Urbanisation of the Sea: From Concepts and Analysis to Design*, ed. Nancy Couling and Carola Hein (naio10, 2020). It includes excerpts from Carola Hein, 'Oil Spaces: The Global Petroleumscape in the Rotterdam/the Hague Area', *Journal of Urban History*, no. 43 (2018). On blankness, see also: Nancy Couling and Carola Hein, 'Blankness: The Architectural Void of North Sea Energy Logistics', *Footprint*, no. 23 (2018).
2. Henri Lefebvre, *The Production of Space* (Blackwell, 1991), 26–27.
3. Carola Hein, 'Analyzing the Palimpsestic Petroleumscape of Rotterdam', Global Urban History Blog (28 September 2016), <https://globalurbanhistory.com/2016/09/28/analyzing-the-palimpsestic-petroleumscape-of-rotterdam/>; 'Port Cities: Nodes in the Global Petroleumscape between Sea and Land', *Technosphere Magazine* (15 April 2017); 'Between Oil and Water: The Logistical Petroleumscape', in *The Petropolis of Tomorrow*, ed. Neeraj Bhatia and Mary Casper (Actar / Architecture at Rice, 2013); 'Global Landscapes of Oil', *New Geographies* 2 (2009).
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7. Denis Wood, *Power of Maps* (Guilford Press, 1992).
8. For map covers and the Rotterdam refinery map by BP from 1970, see 'Oil Company Roadmaps from the Netherlands', <http://www.petroldmaps.co.uk/country/maps-nl.htm>.
9. Port of Rotterdam, Netherlands, 'Port of Rotterdam', <http://www.ship-technology.com/projects/portofrotterdam/>.
10. There is also an extensive NATO pipeline system; see 'Central Europe Pipeline System (CEPS)', https://www.nato.int/cps/en/natolive/topics_49151.htm?selectedLocale=en.
11. Dominic Boyer and Imre Szeman, 'The Rise of Energy Humanities: Breaking the Impasse', *University Affairs* (2014), <http://www.universityaffairs.ca/opinion/in-my-opinion/the-rise-of-energy-humanities/>.
12. See, e.g., Jo Clarke, Mel Evans, Hayley Newman, Kevin Smith, Glen Tarman, eds., *Culture Beyond Oil: Not If but When* (Platform, 2011), <http://platformlondon.org/cbo.pdf>; Imre Szeman, Sheena Wilson, and Adam Carlson, eds., *Petrocultures: Oil, Energy, and Culture* (McGill-Queen's University Press, 2017); Imre Szeman and Dominic Boyer, *Energy Humanities: An Anthology* (Johns Hopkins University Press, 2017).
13. Dominic Boyer, 'Special Collection: Energopower and Biopower in Transition', *Anthropological Quarterly* 87, no. 2 (2014).



Waalhaven Airport, 1932

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