Netherlands Enterprise Agency

Report

International earning potential of the Dutch bicycle sector

November 2024

Content

Executive Summary

The Netherlands is a leader in cycling expertise, including bicycle[1] manufacturing, advanced mobility services, and infrastructure design. This second edition of the Netherlands Enterprise Agency (RVO) report assesses the current state and trends within the sector, identifies opportunities, and suggests ways to strengthen the international position of the Dutch bicycle sector.

Growth Remains Strong, but is Leveling Off

The Dutch bicycle sector has experienced years of solid growth, as confirmed by the latest figures from the Dutch statistics agency CBS. Driven by the COVID-19 pandemic and the increasing popularity of e-bikes, the production value reached €3.24 billion in 2022, an increase of 79% since 2015. Despite recent challenges, such as the initial global supply chain disruption and subsequent market surplus, the sector's strong foundation is expected to support a resurgence in growth.

The robust domestic performance is reflected in the sector's export value, which has increased from €1.1 billion in 2015 to €2.37 billion in 2022. The Netherlands continues to be an example of integrating cycling into sustainable transport solutions, shaping markets, and delivering significant social benefits. Projects between Dutch and other European cities highlight the sector's contribution to social benefits across the continent.

Cycling as Ecosystem

Beyond mere production statistics, the Dutch bicycle sector represents a comprehensive ecosystem that includes manufacturing, retailing, policy, user experiences, and cultural repertoires. This ecosystem is supported by three primary systems: (1) the utilitarian bicycle system, (2) urban logistics using cargo bikes, and (3) the leisure bicycle system, all of which benefit from a sophisticated environment of companies, policies, knowledge, and cultural values. Leading manufacturers such as Pon and Accell, as well as a large number of small and medium-sized companies, are increasingly focusing on sustainability and corporate social responsibility.

The Dutch cycling ecosystem is not directly exportable, but components of the system and the overall concept of the cycling ecosystem can be adapted to different international settings. Embedding these in local conditions creates a fertile ground for the export of Dutch products, knowledge, and services. Notable mobility innovations with international impact include *Swapfiets* (Swap Bicycle), Lease a bike, and *OV-Fiets* (Public Transit Bike), each influencing cycling behavior and adding social value in their own way. Supported by the International Clean Energy Partnership (ICEP), RVO facilitates the sector's outreach through trade missions and international networks.

Exporting Knowledge and Innovation

Exporting knowledge has been and still is an important aspect of the Dutch bicycle sector. Initiatives like the CIVITAS Handshake project (2019-2022) demonstrate the Netherlands' ability to improve sustainable urban mobility across Europe through policy support, practical workshops, and standardized methodologies.

Various engineering and consultancy firms are dedicated to exporting cycling knowledge, ranging from well-established companies to specialized cycling consultancies. The Dutch Cycling Embassy plays a key role in promoting this sector by organizing workshops and activities both nationally and internationally, focusing on the dissemination of Dutch cycling expertise.

[1] In this report, 'cycling' and 'bicycle' refer to both cycles with two and cycles using more than two wheels.

Creating Optimal Cycling Conditions

Dutch cycling experts have identified several key factors that are essential for promoting optimal cycling conditions worldwide. These include designing urban spaces that are conducive to cycling, providing alternative mobility options, implementing supportive transport policies, engaging in active social movements, and cultivating a culture that values cycling. This expertise is used to advise governments, NGOs, and companies around the world on how to create effective conditions for cycling.

Particularly in middle- and low-income countries, the Dutch Ministry of Infrastructure and Water Management, in cooperation with the Benelux countries, has initiated a global program for capacity building in active mobility. This program, which involves various international partners, aims to train 10,000 new cycling experts by 2033 and to improve global cycling infrastructure and advocacy.

Conclusion

The Netherlands has a long-standing and innovative cycling sector, underpinned by a solid foundation for international knowledge sharing and capacity building in cycling. This is supported by leading international coalitions and a long tradition of innovation in cycling infrastructure. To continue to lead in this increasingly competitive international market, the Netherlands must capitalize on its strengths in utility, freight, and recreational cycling systems. Achieving this will require a coordinated strategic approach involving businesses, knowledge institutions, and government agencies. The focus needs to remain on innovation, international cooperation, and the promotion of sustainable and healthy living.

Introduction

The Netherlands is recognized worldwide for its extensive cycling expertise, ranging from bicycle manufacturing to advanced mobility services and infrastructure design. This was already evident in '*Het Internationaal Verdienpotentieel Nederlandse Fietsensector*' (2022), the first edition of this report.

The Dutch bicycle industry is characterized by a robust domestic manufacturing industry, including two of the world's largest bicycle manufacturers, Pon and Accell, and a thriving sector of medium and small companies. The Netherlands has also developed unique, innovative mobility concepts such as OV-fiets, Lease a bike and Swapfiets. The Netherlands also excels in bicycle infrastructure, transport models, and international knowledge transfer through bicycle consultancy and knowledge institutions. Despite these strengths, this edition, like the previous one, makes it clear that the Netherlands is not taking full advantage of its unique position in the global bicycle sector. What are the reasons for this, and how can current initiatives be expanded and accelerated? This report checks the temperature in 2024. The central question is how the Netherlands can strengthen and expand its unique position in the international bicycle sector.

The '*Wet van de remmende voorsprong*'[2] can be an obstacle to further development. The Netherlands is a leader in bicycle production, use, infrastructure and knowledge transfer. In the Netherlands, 28% of all trips are made by bicycle. Of these, 70% use a conventional bicycle and 30% an electric bicycle or e-bike for short.[3] This widespread acceptance benefits from excellent bicycle infrastructure that facilitates daily use, mostly with the support of government and civil society organizations.

This report examines recent trends in the Dutch bicycle industry and its growth potential, with a particular focus on the unique Dutch cycling ecosystem and export opportunities. It is routine to talk about the unique Dutch 'bicycle culture.' It is more accurate to speak of a cycling ecosystem.[4] This system includes not only the production of bicycles, but also integrates industry, policy, infrastructure, knowledge and consumer behavior. This system enjoys global recognition because of the Dutch expertise in both traditional and innovative cycling solutions.

This report describes the current situation and trends, identifies opportunities and proposes concrete strategies to better position the Dutch bicycle industry internationally. In the following chapters, we will further analyze the Dutch bicycle sector, including its unique bicycle systems, export position, and future opportunities and challenges. In doing so, we emphasize the importance of leveraging the entire cycling ecosystem for sustainable international success.

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2 "Wet van de remmende voorsprong." It was first used by Jan Romein in 1937 to describe how an early lead in an economic sector might become a disadvantage as conditions change. Early success may reduce the incentive to innovate, causing the leader to be overtaken by others.

3 De Haas, Mathijs de, and Kolkowski, Lukas (2023). *Fietsfeiten 2023*.

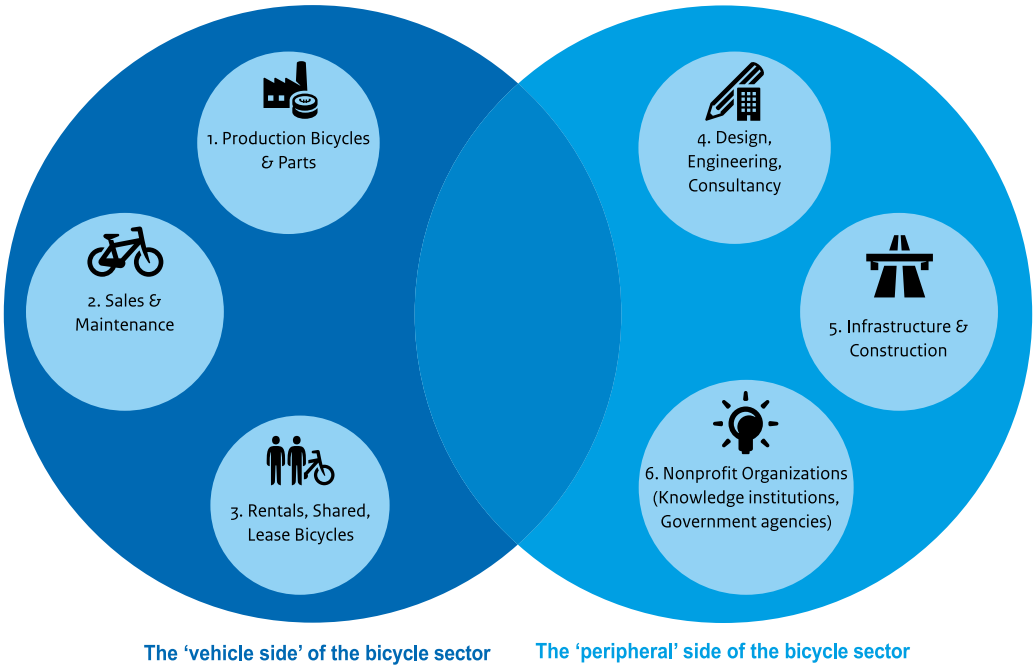
4 Kuipers (2022). *The Rise and Decline of National Habitus: Dutch Cycling Culture and the Shaping of National Similarity*.

1 Strong Nationally, Promising Internationally

1.1 Strong National Economic Position

The figures for the period 2020-2024 are exceptional. During the COVID-19 period therewas growth. In the spring of 2024, however, the newspapers were full of reports of a bicycle industry in crisis, both globally and in the Netherlands.[5]

Figure 1: *Breakdown of the Dutch bicycle sector into sub-sectors.*



For the purposes of this report, the Dutch bicycle sector has been divided into six sub-sectors. For the companies active on the vehicle side, CBS has a picture of the economic development in the period 2015-2022. For the companies active on the peripheral side of the bicycle sector, it is not possible to provide economic figures attributable to the bicycle[6]**.**

The Dutch bicycle companies (as described in Figure 1) have gone through a turbulent period.[7] After a small downfall as the result of global supply chains challenges first, followed by market surpluses, the sector seems to resume the growth due to its strong basis. As the available figures from Dutch Statistical Agency CBS in the table below show, the number of companies specializing in bicycles increased by more than 13% between 2015 and 2022.[8]

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5 2024, 'High inventories plunge Stella Bicycles into crisis,' Supply Chain Magazine; 2024, 'Wholesaler AGU sucked in by malaise in bicycle industry,' Financieel Dagblad; 2024; 'Lower bicycle sales for Pon due to 'challenging' market," Financial Daily.

6 Companies in the design, engineering, and consulting, and infrastructure and construction sub-sectors are not broken down by bicycle sector in the CBS data. However, Dutch companies are international leaders in the design and construction of bicycle infrastructure. Government and knowledge institutions are not included in the economic indicators, but are considered part of the bicycle sector in this report.

7 GFK (2023), *Bicycle Sales 2023.*

8 CBS (2024), *Report* 2015-2022. Economic indicators bicycle sector, 2015-2022 | CBS

The number of companies focusing on bicycle sharing, leasing, and rentals has increased at an above-average rate of 50%. The same is true for companies focused on manufacturing bicycles and parts. This category grew by 46%.

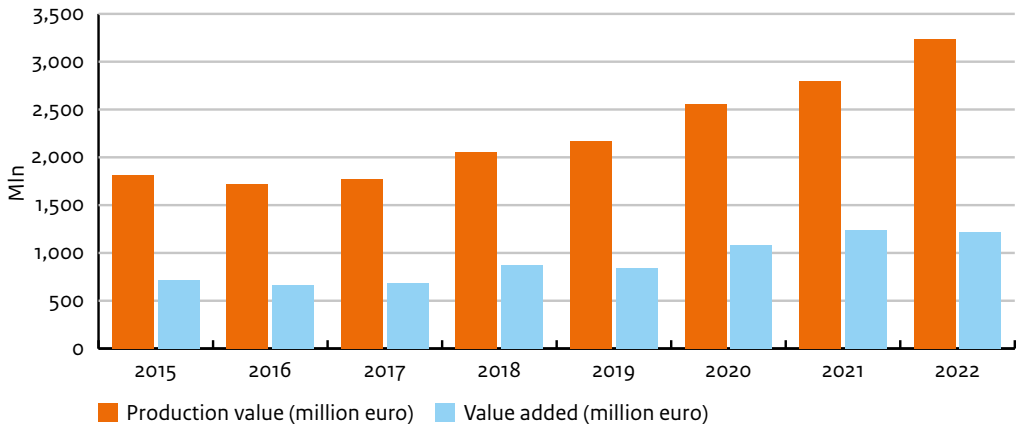
Table *Number of companies in the bicycle industry*

	2015	2016	2017	2018	2019	2020	2021	2022
Bicycle and parts manufacturing	120	115	135	145	160	160	175	175
Wholesale of bicycles and mopeds	425	445	440	445	495	500	525	525
Retail sale bicycles and mopeds	2,415	2.500	2,520	2.505	2,500	2,550	2,615	2,615
Bicycle sharing, leasing, rental	120	130	130	140	145	140	160	180
Total bicycle sector	**3,080**	**3,190**	**3,225**	**3,235**	**3,300**	**3.350**	**3,475**	**3,495**

Source: CBS

The CBS figures in Figure 2 with the economic indicators show that the total production value of the bicycle sector (excluding mopeds and scooters) increased by 76%, from €1,810 million in 2015 to €3,240 million in 2022. The majority (51% in 2022) was accounted for by companies focused on the production of bicycles and parts, 24% by retail trade, 22% by wholesale trade and 3% by shared, leased, and rental bicycles. In the latter category, the production value increased from €10 million to €90 million between 2015 and 2022.

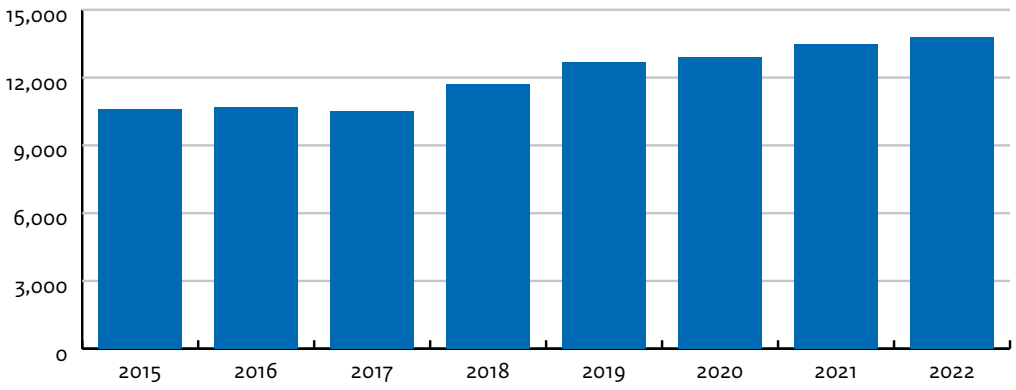
Figure 2 *Development of economic indicators of the Dutch bicycle sector between 2015 and 2022*



Evolution of the total production value and value added of the Dutch bicycle sector in million euros based on CBS figures

The increasing number of companies and production value also led to an increase in employment in the bicycle sector (excluding mopeds and scooters). As shown in Figure 3, it increased by about 30%, from 10,600 to 13,800 full-time employees. In relative terms, the largest increase in employment was in the subsector of bicycle sharing, leasing, and rental, with an increase from 200 to 1,000 full-time employees This increase does not include the very largest player, Dutch Railroad Company public bike system, NS OV-fiets.[9] These figures underline the importance of these new business models and the emergence of new ways of organizing mobility for Dutch economic development.

Figure 3 *Employment development in the Dutch bicycle sector between 2025-2022.*



Development of employment in the Dutch bicycle industry in FTE based on figures from CBS.

[9] Compared to the previous edition of this report, leasing companies have been added to the CBS dataset, but OV-fiets is not included as it is much larger than other companies.

A notable development in the sector is the trend to blur the traditional boundaries between different sectors within the mobility sector. Car manufacturers are focusing on bicycles, and traditional bicycle manufacturers are increasingly expanding into the field of micro-mobility.[10] This points to the development of innovative mobility solutions that meet the needs of a changing market in terms of sustainability.

The growth of the bicycle sector in these years is partly due to COVID-19. In 2023 - a year not included in the CBS figures - the sector was faced with the consequences of the pandemic. The number of new bicycles sold in 2023 was 27% lower than in 2020 (from 1,098,000 to 804,000). The industry faced high purchase prices, supply chain problems, and now surplus problems.

Of note is the large share of e-bikes, which accounted for 56% of the market and almost 80% of total sales, amounting to €1.17 billion. The average price of a new bicycle increased by 2.4% to €1,815 by 2023, with an even higher increase for e-bikes to an average price of €2,574.

[10] This includes compact, efficient, lightweight short-distance transport, such as electric scooters, bicycles, e-bikes, skateboards, and motor scooters, which are particularly suited to congested urban environments. In addition to these personal transportation options, there are also specialized forms of cargo bicycles, such as cargo bikes with large charging platforms. RVO (2024). *Cargo Bikes and City Logistics.*

BOVAG emphasizes that, despite the problems, the bicycle sector in the Netherlands is in a strong position and is picking up the pre-pandemic trend and is expected to grow again through innovation and sustainability initiatives. For example, the growing popularity of e-bikes offers opportunities, even if the transition to this new form of mobility is slower than expected in the short term both internationally and nationally. According to a representative of Pon, the most promising international markets for the relatively high quality and more expensive high-end products are in Europe and America.[11]

Going forward, the implementation of European policies on sustainability and circular production will be crucial. These will force the industry to innovate and perhaps strengthen the production base within the EU, particularly in countries such as Portugal, Lithuania and Bulgaria, to reduce dependence on non-European supply chains such as China's.[12]

Targeted financial and technical programs for SMEs within the bicycle sector are essential to comply with upcoming EU regulations and to stimulate innovation. This will enable small Dutch manufacturers to adapt to new standards and strengthen their market position.[13]

1.2 Export Development of the Dutch Bicycle Industry

Despite its strong starting position, the question is to what extent the Dutch sector seizes its strength internationally in terms of imports and exports. The available import and export figures give a mixed and unclear picture of the Dutch international position.

The Netherlands imported about 3.3 million bicycles in 2021. This is almost three times its own production of 1.2 million. These figures seem to indicate the procurement of cheaper bicycles, while the Dutch industry specializes in the more advanced and high-end bicycles.

[11, 11, 12] Interview with Gense

Most of the imported bicycles came from EU countries, but countries outside the EU also supplied a large number of bicycles. Exports, on the other hand, went almost exclusively to EU countries. The market outside the EU was hardly served, if at all.

The same is true for e-bikes. Most were imported from EU countries. Again, exports went almost exclusively to EU countries and hardly to non-EU countries.

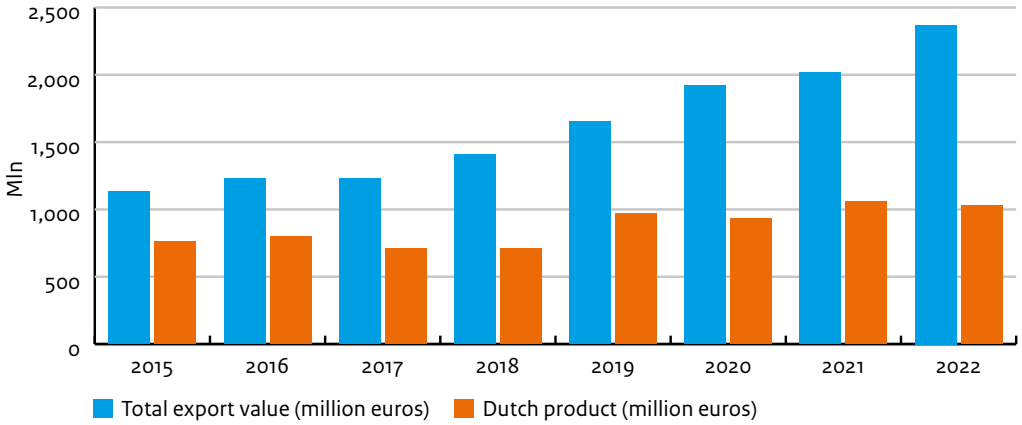
Table *Imports and exports of bicycles (2021)*

	Total Bicycles		Electric Bicycles	
	Number (x 1000)	Value (x 1000 Euro)	Number (x 1000)	Value (x 1000 Euro)
Total Imports	*3,308*	*717*	*876*	*916*
EU	2,313	455	609	621
non-EU	995	262	267	295
Total Exports	*1,088*	*793*	*725*	*1,090*
EU	1,076	790	701	1,056
non-EU	12	3	24	34

Source: Mobility in figures, Two-wheelers 2023-2024

According to CBS figures, the export value of the bicycle sector grew significantly between 2015 and 2022, from €1.1 billion to €2.4 billion, as shown in Figure 4. However, it is noteworthy that an increasing share of the export value is determined by non-Dutch products. While Dutch products accounted for 67% of the export value in 2015, this share had fallen to 44% in 2022. It seems that the Netherlands is becoming more of a transit country for bicycles. At the same time, it can be concluded that a considerable part of Dutch production is sold abroad.

Figure 4 *Evolution of the export value of the Dutch bicycle sector between 2015 and 2022*



Development of the Dutch bicycle sector's export value and share of Dutch product in millions of euros based on CBS figures

1.3 Social Value Added

An assessment of the international position and profitability of the Dutch bicycle industry goes beyond the usual economic issues such as production, employment, imports and exports. Cycling has wider, social benefits. The field of bikenomics seeks to analyze the economic impact of these effects by weighing the costs and benefits. In her influential book *Bikenomics: How Bicycling Can Save the Economy* (2011), Elly Blue argues for the financial benefits of bicycling, such as savings in health care, land use, fuel, and travel time. Since then, Decisio has developed this approach for cycling projects in the Netherlands and abroad. It estimates costs and benefits, identifies and quantifies social impacts, and then monetizes them. The result is a calculation of the net effects and an analysis of the sensitivity based on certain assumptions and models.

It helps policy makers to substantiate their decisions on bicycle infrastructure and programs.[14] The report discusses a number of bicycle projects abroad in which the Netherlands is involved. Calculations by Decisio were included in their evaluation. More generally, Decisio has calculated the impact of *Nederland Fietsland* worldwide using the bikenomics calculation method (see appendix for explanation).[15] For 2022, the estimated annual value is between €1.2 and €3.8 billion. The social benefits of cycling include effects such as accessibility, health, road safety, and climate. In other words, the Dutch bicycle industry not only generates economic value, but also considerable social added value. We discuss this in more detail later in this report.

In summary, during the pandemic, the bicycle industry was faced with an explosive consumer demand for bicycles. At the same time, suppliers found it increasingly difficult to meet demand due to stringent measures and factory closures in Asia. The bicycle industry increased production at higher purchase prices. As demand returns to pre-pandemic levels, manufacturers are left with unsold inventory. The figures in the 2020 report and the current 2024 edition only partially capture this turbulence.[16] Looking beyond this exceptional situation, the trend is toward stabilization and eventually, an expected steady line of growth.

[14] Interview with Campisi.

[15] Decisio 2024. Bijlage: Onderzoeksverantwoording maatschappelijke waarde Nederlandse fietsenexport (rvo.nl)

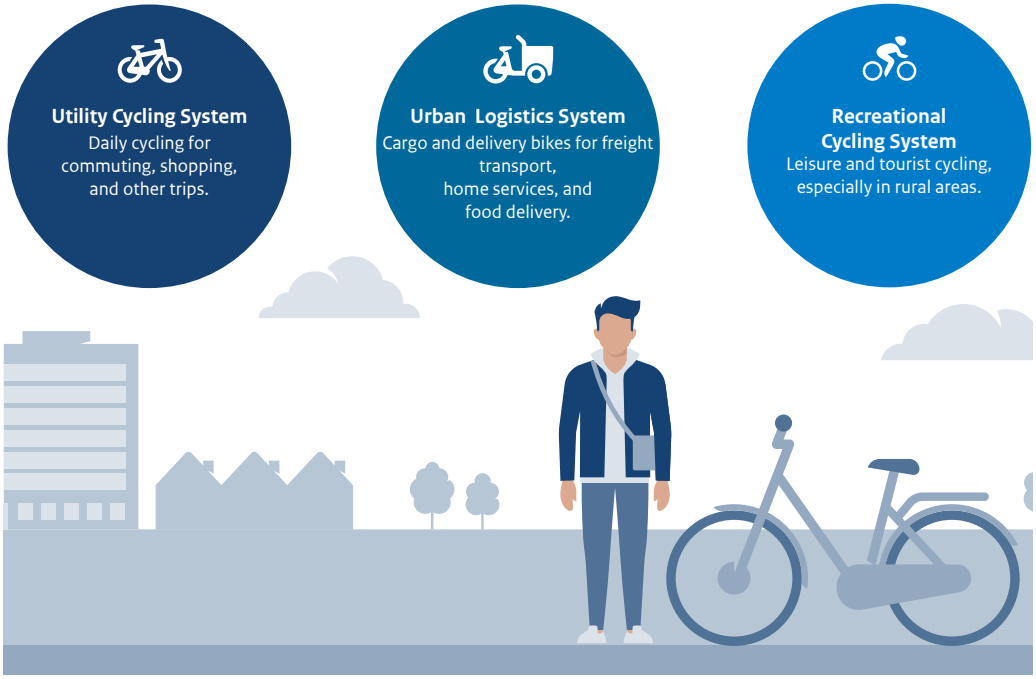
[16] The 2022 RVO report is based on 2015-2020 figures. For the current edition, the CBS figures extend to 2022, but do not cover the turbulent period up to spring 2024.

2 Three Unique Dutch Cycling Systems

Cycling does not only consist of the bicycle, the manufacturer, the bicycle shop, and the bicycle path. It also consists of regulations (the law requires a bicycle to have a front and rear light), policy (the government encourages cycling for accessibility and health reasons), safety (the number of accidents among the elderly is increasing due to more use of e-bikes), climate (E-bikes become an alternative to cars in the city and reduce CO^2 emissions). All these aspects cannot be considered in isolation. Therefore, cycling can be seen as an ecosystem - a coherent set of very different elements. be seen as an ecosystem - a coherent set of very different elements. Cycling as an export product should consequently be approached in this way. The focus is not on the export of the bicycle or e-bike, but on the export of the bicycle system as a whole.

Interviewees consistently emphasize the importance of continued support not only from civil society organizations and government, but also from the manufacturing industry for policies that promote bicycle use, such as the development of shared mobility infrastructure, the construction of bicycle lanes and paths, safety measures, and bicycle parking facilities.[17] In the Netherlands, three cycling systems can be distinguished, as shown in Figure 5: (1) the utility cycling system, (2) the freight cycling as urban logistics system, and (3) the recreational cycling system. Each type of system has its own specific characteristics and uses, depending on the needs of the user and the environment. Each use requires different design strategies. So do political and social integration, and ultimately successful export.

Figure 5 *The three distinct cycling systems in the Netherlands*



[17] Interview with Bot; Interview with Veraart; Interview with Gense.

These systems sometimes function independently and sometimes overlap, each with specific Dutch characteristics and their own challenges and opportunities. However, not all Dutch people have equal access to these systems.[18] There is also geographic overlap: utilitarian cycling also occurs in rural areas, while recreational and tourist cycling also occur in urban areas. Both are supported by municipal (local) and provincial (regional) policies.

- Utility Cycling System, focused on daily use in urban areas, facilitates commuting and running errands with amenities such as bicycle racks and parking.
- Urban Logistics System, uses specially designed cargo bikes and related infrastructure, such as logistics hubs, to efficiently transport goods within cities for the benefit of entrepreneurs in the Netherlands.
- Recreational Cycling System in rural areas, including infrastructure such as bicycle routes, small ferries, ferry services, catering and bicycle rentals, promotes recreational cycling and bicycle tourism, which contributes to the local economy and tourism from home and abroad.

We will use these three systems to examine the international activities of the bicycle industry and government initiatives in the following chapters

2.1 Utility Cycling System

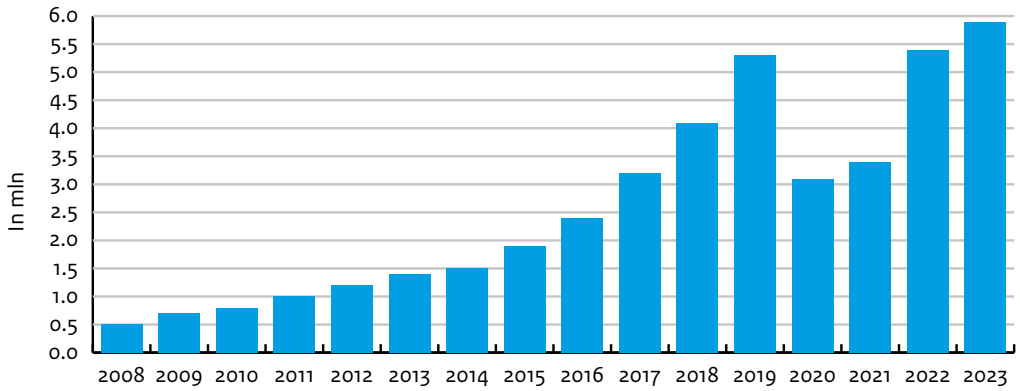
The Netherlands is particularly well known for utilitarian cycling as a sustainable solution. This is not surprising. The Dutch cycle mainly (28%) for practical purposes such as commuting to work or school and running errands. They do so with a traditional pedal bike (70%) or an e-bike (30%).[19] These bikes are often robust and equipped with transport features such as luggage racks, panniers and baskets for carrying goods, in addition to jacket and chain guards and horseshoe locks. The wide acceptance of utilitarian cycling is supported by an excellent infrastructure for everyday cycling.

A specific Dutch innovation symbolizes this utilitarian cycling par excellence: The Dutch OV-fiets. This bicycle - an initiative of the Dutch Cycling Union (Fietsersbond), adopted by the Dutch Railroad Company (NS) - is a unique innovation within the urban mobility system – especially in the western, densely populated part of the Netherlands (Randstad). The popularity of the OV-fiets grew rapidly. From 800,000 rides in 2008, the number quintupled to 4.1 million in 2018. The COVID-19 pandemic caused a temporary dip, then growth resumed to nearly 6 million rides in 2023. The public bike system is an essential link between train travel and the final destination (last mile). It provides a smooth door-to-door travel experience by seamlessly integrating bicycle and train transportation. Created through cooperation between users and producers, this concept symbolizes the potential within the bicycle sector to encourage sustainable travel behavior and contribute to sustainable urban mobility goals.[20]

[17, 19] Patrick Bek (2021). *No Bicycle, No Bus, No Job.* Amsterdam University Press.

[20] Jan Ploeger (2024). *Verstandshuwelijk van de Fiets-Trein*.

Figure 6 *Development of the number of trips by public-transport bicycle between 2008 and 2023*



Growth in the number of annual trips made with the OV-fiets from its introduction in 2008 to 2023, based on NS Bicycle data

This extensive urban bicycle system is in stark contrast to another part of the Netherlands. The accessibility of rural Netherlands is under pressure due to the decreasing availability of public transportation and increasing dependence on the car. This trend, often referred to as the impoverishment of public transit, is forcing rural residents to use their own means of transport, leading to increased car dependency. This not only has environmental consequences, but also widens the socio-economic gap between urban and rural areas.

Bicycles and e-bikes could provide a link in the rural public transit system and improve accessibility. E-bikes, with their greater range and ease of use, are particularly suitable for longer distances, which are common in rural areas. However, rural accessibility requires different public investments than urban cycling, such as the construction of continuous cycle routes.[21]

OV-fiets

The Dutch Railroad Company's OV-fiets has a network of 21,700 bikes across nearly 300 locations. This provides a seamless transition to and from public transit. Policymakers appreciate how the system has not only boosted the use of public transit. It also serves as a catalyst for sustainable mobility. The steady growth in the use of the OV-fiets through 2019, despite a temporary decline during the pandemic, highlights the popularity and the success of this system. Innovations by the Dutch Railroad Company, such as the introduction of smart locks that can be opened with an OV chip card (i.e., a smart card to travel on public transit) and experimenting with electric OV bicycles, underpinned the commitment to improve and expand this system. A national newspaper, De Volkskrant, called the bicycle-train-bicycle system of commuters 'the blue-and-yellow wonder and symbol of the unique bicycle infrastructure of urban Netherlands.'[22]

[21] Interview with Bot. See also shared mobility program (cycling not well invested yet). Brief regering; Stand van zaken Samenwerkingsprogramma Deelmobiliteit.

[22] Schoorl (2023). *Het geel-blauwe wonder* Volkskrant

2.2 Freight Cycling Urban Logistics System

In the Netherlands, but also worldwide, policymakers are looking for solutions to keep their cities livable through far-reaching measures that discourage car use. In response, entrepreneurs are experimenting with various forms of micromobility for freight transport. In the Netherlands, high-quality, innovative cargo bikes have taken off in urban logistics. The 2024 report *Opportunities for cargo bikes in urban logistics* by the Netherlands Enterprise Agency highlights the growing role of cargo bikes in urban logistics, driven by the development of e-bikes.[23] *Transport en Logistiek Nederland* estimates that more than 3,500 cargo bikes were active in early 2022, with a projected growth to around 10,000 by 2025.

In the Netherlands and internationally, cargo bikes are becoming increasingly popular for postal and courier services, meal delivery, goods delivery, and shopping. With improvements in electric pedal assistance, cargo bikes are now able to cover longer distances and carry heavier loads. This contributes to their appeal for both private use and logistics purposes.

The Dutch manufacturing industry plays a leading role in the production of these high-quality vehicles, including manufacturers such as Urban Arrow, Fulpra, and Bakfiets.nl. The demand for cargo bikes is growing due to increasing urban traffic and the focus on sustainable logistics. Technical improvements and cooperation between manufacturers and users play a crucial role in the development of cargo bikes, which are now considered an essential component of Light Electric Vehicles (LEVs) in urban mobility.

The use of cargo bikes offers several advantages, such as optimization of the logistics process, cost savings, sustainability, and a larger pool of potential employees. Cargo bikes are particularly relevant for bicycle couriers, package delivery companies (such as DHL and PostNL), retailers (such as Bol.com and Coolblue), and service companies (such as plumbers and painters).

[23] RVO (2024). *Opportunities for Cargo Bikes in Urban Logistics.* Netherlands Enterprise Agency

A lot of experience has been gained in recent years. Last mile efficiency and flexibility have improved. Regular maintenance is necessary. Behavioral change and staff training are important. The establishment of hubs is considered an essential part of the logistics process. For retailers, optimizing the freight bicycle system is a prerequisite for local delivery by cargo bike. They also see it as an effective marketing tool.

The Cargo Bike

Increasingly busy city centers and the introduction of low emission zones are motivating business owners to switch to cargo bikes. In addition to flexibility and business benefits, sustainability and the desire to contribute to a more pleasant cityscape also play a role. Further development of cargo bikes by the industry, focusing on reliability, lower maintenance costs and new leasing concepts, will increase their attractiveness to entrepreneurs.

Cities can support this potential through appropriate incentives, regulations and facilities. Maintaining the current advantages is essential for entrepreneurs, while possible new regulations, such as a driver's license requirement for freight bicycles, may negatively affect their attractiveness. A more positive image of the freight bicycle, supported by good experience, communication and enforcement of traffic regulations, is needed to promote widespread acceptance and growth in use.

2.3 Recreational Cycling System

Internationally, the Netherlands is on the map especially for urban, utilitarian cycling for personal transport like bicycle commuting. Foreign policymakers see it as a policy tool for liveable cities—and the Dutch consultancy sector focuses on its export. The Netherlands also has another, partly unique bicycle system: the leisure bicycle system. Rural Netherlands plays a leading role here.

Recreational and sports bicycles, such as road bikes and mountain bikes, are designed for speed, efficiency and performance in various terrains. Recreational cycling takes place mainly in rural areas and has a long history, think of the interurban cycle paths and the famous ANWB 'mushrooms' (i.e., destination distance signs for bicycles shaped like mushrooms).[24] In recent decades, it has strongly been promoted by an infrastructure of bicycle-friendly facilities and Dutch cycling routes (think of the bicycle junction network and more specialized companies active in the field of routing).[25] The development of this cycling system has greatly improved the image of the Netherlands as a cycling country. Among foreign tourists, 'The Netherlands, the country of cycling' is the third most important reason for choosing our country. The surveys underline the importance of recreational cycling for both the tourism industry and the local economy.[26] The Netherlands Tourist Board (not the industry) takes the lead in promoting the Netherlands as a cycling country.[27] The *Stichting Landelijk Fietsplatform* - the independent coordinating body for recreational cycling in the Netherlands - acts as a national resource center and is responsible for the national cycling route network (LF-net). Members of the foundation are: ANWB, *Fietsersbond*, *Nederlandse Toer Fiets Unie* (NTFU), RAI (cycling department) and the provinces (IPO). They work together with the Netherlands Board of Tourism and Conventions (NBTC), VVV Netherlands, RECRON and *Koninklijke Horeca Nederland*.

Recreational cycling contributes to rural vitality
This is an opportunity for rural Netherlands. Recreational cycling and bicycle tourism are economically important. This is true for the Netherlands as a whole, but also for the local economy in tourist regions in rural areas. The rural parts of the country are facing major challenges in agriculture and deindustrialization. This combination of challenges requires both innovative agricultural solutions and new economic development strategies to ensure rural vitality and a balanced relationship with the urban area.[28]

2.4 Dutch Cycle Systems as International Brand

In summary, the three bicycle systems discussed form the basis of the unique Dutch cycling ecosystem. In addition, the Netherlands is home to large bicycle manufacturers such as Pon and Accell, which underscores its industrial capacity and innovative strength. There is a rich diversity of small and medium-sized companies with a strong focus on sustainability and corporate social responsibility, driven by new urban regulations. This is reflected in the development of e-bike cargo transport for urban logistics, in line with the global trend towards environmentally friendly transport solutions. The question is whether it is possible to leverage this manufacturing industry and bicycle systems internationally.

The previous issue emphasized the need for a strong international brand identity, for example by appointing a 'cycling envoy'. Similar to the 'water envoy', this envoy could act as a contact point and ambassador for the Dutch bicycle sector worldwide. We will discuss this in more detail in the next chapter.

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[24] Dekker, Cycling Pathways, Interview with Veraart.

[25] Nederland Fietsland; For example, Folkersma Routing and Sign has been in business since 1998.

[26] Interview with Bot; *Recreational Cycling in the Netherlands (2021)*; *Onderzoek Knooppuntroutes (2022)*; *Continu Vrijetijdsonderzoek (CVTO) (2018) and Mobility Dutch Population (MON) (2021)*. The studies do not indicate that the choice of cycling in the Dutch urban environment also motivates tourists. *See also ECF (2018)*. '*Benefits of cycling*.

[27] In the U.S., where the industry has to capture the market, the sector has proportionately invested more, for example through People4Bikes.

[28] Interview with Veraart.

3 Exporting Innovative Concepts

The Dutch cycling ecosystem cannot be exported one to one. The context and characteristics of the ecosystem are too specific. What can be exported are parts of the system and the concept of the cycling ecosystem. We have already discussed the export of cycling and e-bikes, the economic way of looking at exports. In this chapter, we highlight the export of about three innovative concepts from the cycling ecosystem that deal with bicycle use rather than bicycle ownership. These examples give a picture of innovative developments in the sector, but by no means pretend to give a complete picture of innovation in the bicycle sector. The next chapter (chapter 4) focuses on the transfer of knowledge about cycling in the Netherlands. Chapter 5 focuses on the concept of the 'cycling ecosystem.'

3.1 Swapfiets

The Dutch company 'Swapfiets' (Swap Bicycle) introduced its leasing concept to the European market. It offers bicycle leasing to more than 280,000 members in the Netherlands, Germany, Belgium, Denmark, France, Spain and the UK. At Swapfiets, subscribers can choose from various models of bicycles and e-bikes. If a bicycle breaks down or needs repair, it can be swapped for a replacement bicycle immediately and the broken bicycle is repaired and put back into circulation. Founded in 2014 and now part of the international Dutch company Pon, Swapfiets aims to make European cities more livable by making bicycles more accessible, with the goal of creating a clean, safe, and social environment. In addition, Swapfiets aims to grow to a 100% circular product line and to be carbon neutral by 2025.[29] The economic consulting firm Decisio has tried to calculate the social profit (in Euros) of the international use of the Swapfiets, based on bike-economic models and valuation key figures from the social cost and benefit analysis *Bicycle*.[30] These include: the number of Swap users, the increase in cycling among users, the associated increase in health, the reduction in car use, the reduction in public transport use, and the reduction in CO^2 emissions. Decisio estimates the minimum annual social benefit at 3.5 million euros. This could increase to more than 25 million per year.

Swapfiets—more than just leasing bicycles

As a company, Swapfiets (Swap Bicycle) is characterized by a high level of social commitment. In 2022, Swapfiets officially joined the B Corp community, which recognizes companies that not only seek profit but also want to have a positive impact on society and the environment. Swapfiets supports social initiatives such as donating bikes to students in Senegal and Ukrainian refugees. Moreover, the company strengthens its commitment to the cycling community by participating in various initiatives, such as joining Bicycle Ambassadors, a government program that encourages people in the Netherlands to cycle to work. They also founded and belong to the Club of Circular Entrepreneurs, and attend the Cycling Industries Europe (CIE) summit in Brussels to show their support for the cycling industry. Currently, Swapfiets is focusing on growth within the cities it already operates, rather than on expanding to new cities.

[29] Swapfiets (2022). Sustainability Report Swapfiets

[30] Decisio, (2023). Update SCBA Bicycle 2023

3.2 Lease a Bike

Lease a Bike provides bicycle leasing to about 65,000 companies and their employees in the Netherlands, Germany, Belgium, Austria, Sweden and the United States. This company is the largest bicycle leasing label within Pon. Lease a Bike aims to make bike leasing as easy and accessible as possible for companies and their employees, with the ambition to get all of working Europe on bikes. Companies choose to offer bicycle leasing because they have sustainability goals, want to promote employee health, and seek to retain and attract staff. Through Lease a Bike's platform, employees of these companies can choose the bicycle and related services they want, and the employer can offset the cost of the lease against their gross salary. In some countries, tax incentives and regulations make it more financially attractive for an employee to lease a bicycle than to buy one privately.

Market research by Lease a Bike among more than 4,500 Dutch users shows that the leased bike replaces another means of transport on average two to three times a week, especially for commuting. In about 75% of these cases this is the car and 8% public transport.

Lease a Bikers are also relatively likely to choose an e-bike, 79% on average, compared to about half of the cyclists in the countries surveyed. Decisio estimates the social benefits of Lease a Bike at €70 million in 2023.

Lease a Bike – a wide range
Lease a bike offers a wide range of bicycles through its affiliated bike shops to appeal to a diverse audience. Customers can choose from a variety of types and brands available at these stores. The affiliated stores also provide delivery, service, and maintenance, as well as first aid in case of damage or theft of the leased bicycles. The success and growth of Lease a Bike in new markets is highly dependent on local tax laws. Although no specific countries have been identified for future operations, Lease a Bike's goal is to grow in all countries where opportunities exist, taking into account local tax laws.

3.3 OV-fiets and YouBike

Internationally, there is a lot of interest in the Dutch railroad company's (NS) bike-train-bike combination (see also chapter 2). However, the Dutch railroad company has no plans to introduce the system internationally.[31] The company focuses on sharing knowledge about shared bicycle and bicycle parking by contributing to international studies and hosting delegations. However, Taiwan's successful YouBike scheme, set up by bicycle manufacturer Giant and the government, and inspired by the Dutch OV-fiets and the French Vélolib example - shows that exporting this successful model is possible, provided it is properly embedded in the local context.

Launched in 2009, YouBike, has gone through three stages of development: technology transfer, reassembly, and market creation. After a pilot phase, the bicycle-share system grew to a network of 196 rental stations and more than 6,000 bikes by 2015. YouBike exploded to more than 40 million rides, with bikes being used up to 12 times a day. After initial financial losses in the first three years of operation, YouBike became a profitable model in Taipei. Partnering with Giant, a leading Taiwanese bicycle manufacturer, was critical to adapting the technology to local needs. Giant also played a key role in creating a new market for both professional and amateur cyclists. The OV-fiets is as an example of Dutch innovation in sustainable mobility solutions at home. The YouBike system in Taiwan, which is based in part on the OV-fiets, shows there is potential in exporting concepts and sharing systems.[32]

[31] RVO (2020). *International Earning Potential Dutch Bicycle Sector.* Netherlands Enterprise Agency.

[32] Tjaiying (2023). *Technology Practice in Everyday Life*.

4 Exporting Dutch Knowledge

Another export product of the Dutch bicycle sector is knowledge. Knowledge transfer has already been mentioned in the examples above. An example explicitly related to knowledge transfer was the CIVITAS Handshake project. This project - supported by the European Union between 2019 and 2022 - stimulated several bicycle projects in European cities with knowledge transfer, policy support, practical workshops and standardized (evaluation) methods. The Dutch share in the implementation of these cycling projects was considerable.

4.1 CIVITAS Handshake Project

The aim of the CIVITAS Handshake project was to promote cycling in EU cities by creating a platform for cooperation and knowledge transfer. The project facilitated the implementation of more than 60 projects at the local level, including street redesign, bicycle parking solutions, communication and awareness campaigns, and governance arrangements.

Some of the highlights from the Handshake project:

- Amsterdam, together with Copenhagen and Munich, provided tools, expertise, guidelines, and examples to all Handshake cities. This was inspired by Dutch best practices. Amsterdam also hosted several workshops and study visits.

- Amsterdam mentored Turin, Rome, Bordeaux Métropole, and Dublin. Specifically for these cities, the municipality provided direct technical support and inspiration during several online sessions.

- Other Dutch partners played an important role in exporting Dutch best practices. For example, Decisio contributed to the development of a standardized evaluation methodology 'Bikenomics' for assessing the impact of the project both before and after implementation and to support cities in defining cost-effective solutions. The workshops also involved other key external partners, including CROW and the Dutch Cycling Embassy.

Decisio calculated that the Handshake project resulted in a 28% increase in bicycle use across all monitored locations and an 18% decrease in miles traveled in private cars. The total social benefits of the project, before and after the intervention and over a period of up to 30 years, were calculated at €173 million. This is offset by €44.8 million in investments by the cities.[33]

[33] Decisio 2024. Bijlage: Onderzoeksverantwoording maatschappelijke waarde Nederlandse fietsenexport (rvo.nl) Available here

Dutch impact on CIVITAS Handshake Project

Amsterdam was the cycling mentor for Turin, Rome, Bordeaux and Dublin in the CIVITAS Handshake project. The Dutch influence on the policies of the four cities was significant. The cities had a dominant car culture, limited existing bicycle infrastructure and a compact urban layout characterized by short car trips and frequent traffic jams. Translating the Dutch CROW design principles to the local context played a crucial role. This proved successful in achieving smooth bicycle flows and increasing traffic safety.

According to one Rome official, 'The Dutch design practices from the CROW Handbook for Bicycle Traffic were crucial for effective design, applying advanced insights and guidelines to ensure that the new bicycle infrastructure is not only safe, but also accessible and user-friendly.' A colleague in Turin said, 'Thanks to Handshake, I have realized that it is not just about building bike lanes, but about embracing a whole new vision of urban design. While an official from the Piedmont region remarked, 'The problems we have in Italy today are the same ones that Amsterdam has tackled (and solved) in the past, and this is certainly a great inspiration. Besides, if we continue to design a city for cars, there will always only be cars in the city'.

According to Decisio, the effectiveness of the Handshake project would have been lower without the Dutch knowledge transfer. Dutch practices are known for their emphasis on user experience (think design principles such as coherence, safety, comfort, and attractiveness). Through Amsterdam and the involvement of Dutch experts, these were integrated into the designs. The added social value of the Dutch support is estimated by the company to be around €54 million (over 30 years in present value). This translates into an average annual impact of about €2.5 million.

4.2 Cycling Consultancy

The export of Dutch cycling expertise is a thriving industry. Several leading engineering and consultancy firms are active, ranging from established names such as APPM, Arcadis, Goudappel, Mobycon, RoyalHaskoning-DHV, and Witteveen+Bos to specialized bicycle consultancy firms such as Bycs and Stipo. The Dutch Cycling Embassy (DCE) plays a stimulating role in this sector. Recently, the DCE has been active in Ireland, Germany and the United States, among other countries.[34]

The Dutch Cycling Embassy (DCE) acts as an intermediary between the global demand for Dutch cycling expertise and Dutch providers. This public-private network, which focuses on sustainable and bicycle-friendly mobility, represents Dutch cycling knowledge and experience at an international level. The expertise comes from private companies, NGOs and research institutions, as well as government agencies at the national and local level. DCE answers questions and requests about Dutch cycling standards and welcomes delegations from all over the world. Whether in research, planning, policy, product development, manufacturing, construction or design, DCE connects stakeholders with the best possible partners to achieve their goals.

Dutch expertise is effective in dispelling local misconceptions about cycling, such as the assumption that flat terrain is necessary, and emphasizing the universal need for safe and accessible cycling infrastructure. Transfer takes place mainly through workshops. They adapt Dutch design principles to local conditions. These workshops aim not only at demonstrating safe infrastructure, but also at raising awareness of the need for cycling infrastructure. They engage in dialog with a wide range of stakeholders, including elected officials, activists, and civil servants. These interactions also highlight the long-term benefits of bicycle infrastructure, such as improvements in urban development, public health, and the environment.

34 Dutch Cycling Embassy

Stakeholders also identify challenges.[35] The workshops, which often last three days, create enthusiasm and a vision for the future, but are limited in depth. The relatively short duration, limited follow-up, and still lack of a tracking system make it difficult to measure impact.

In some cases, there is a mismatch between the Dutch approach and foreign views and practices. In countries such as the United States and Dubai, cycling is often seen as a niche or recreational activity. In the Netherlands, however, it is an integral part of everyday life. These differences affect the export of Dutch utility cycling and Dutch infrastructure solutions.

Moreover, Dutch engineering and consulting firms no longer have a monopoly. In addition to the Danes, British and Flemish experts are now entering the market. They have adopted and adapted Dutch cycling knowledge to such an extent that buying Dutch expertise is no longer a matter of course. This requires Dutch companies having to work harder to win contracts. The 'Wet van de remmende voorsprong' or the law of first-mover disadvantage is at work here.[36]

Dutch Bike in Dubai

In addition to Europe and the United States, the growing middle class from Cape Town to Lagos and from Dubai to Jakarta offers a new market for bicycles as a lifestyle. For example, AdamBike, a bicycle dealer in Dubai, specializes in importing and selling typical Dutch city bikes and sees great potential for these higher-end bikes. The market in Dubai, which consists of expats and local lifestyle-oriented customers, requires that Dutch bicycles undergo significant modifications to accommodate both cultural and practical aspects. For example, smaller sizes are required (≥6-inch frames instead of 28-inch), and additions such as gears and a combination of hand and coaster brakes are essential. It is also important to focus on low-maintenance materials because of Dubai's humid climate, which poses the risk of rust and sand in moving parts due to sandstorms, and because of the lack of a do-it-yourself repair culture. For recreational use and to meet lifestyle demands, the Dutch bicycle must also undergo aesthetic modifications, such as the addition of wicker baskets, while luggage racks, bells and locks are unnecessary because the bicycles are only used for a day trip along the boulevard and stored indoors.

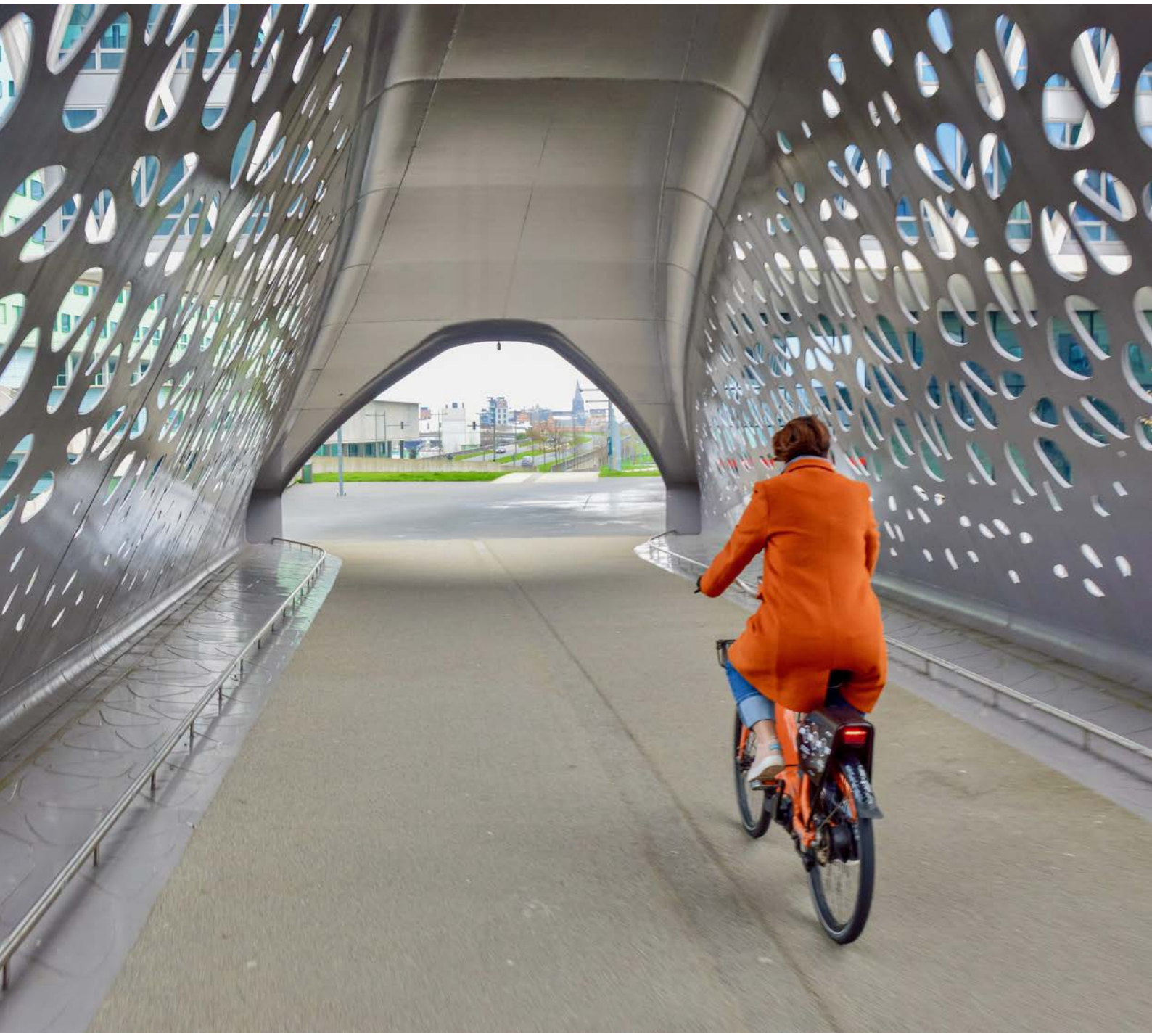
These adaptations show that to succeed in Dubai's luxury market, Dutch bicycles must not only be practical on a product level, but also meet consumers' lifestyle and aesthetic expectations. All of this is separate from the challenges associated with the lack of a widely supported cycling culture, policy and infrastructure in Dubai.[37]

35 Interview with Petzer; Interview with Krizek.

36 Interview with Van der Wijk; Interview with Bot.

37 Interview with Ebbenhout.

Dutch bicycle cycling is more than the sum of urban, rural or freight cycling systems or mobility solutions. Rather, it is an ecosystem. The Netherlands has developed a unique cycling ecosystem consisting of a mix of large players and innovative start-ups. This ecosystem offers a wide range of solutions beyond bicycle production. It includes urban planning, infrastructure development, and the provision of knowledge and innovative concepts that integrate cycling into broader social and mobility projects. The question is whether and how this ecosystem can be exported. What are the opportunities and challenges?



5 Exporting the Cycling Ecosystem

It is possible to export components of the Dutch cycling ecosystem. Bicycles and e-bikes produced in the Netherlands are sold in European countries. Concepts such as the Swapfiets can be seen in France and Spain. Amsterdam shares its bicycle policy experience with Rome and Bordeaux, among others. Bicycle consultants disseminate basic knowledge about the Dutch bicycle infrastructure. The focus is often on the use of the utility bicycle.

What cannot be exported is the Dutch cycling ecosystem as a whole. The Dutch context is too specific and the ecosystem has its own characteristics. What can be exported is the concept of the cycling ecosystem as a way of researching, analyzing and evaluating the phenomenon of cycling. The question then is: what aspects should foreign policy makers and other stakeholders take into account when approaching the cycling ecosystem? What factors should they consider? What can we learn from the evolution of Dutch cycling?

How to approach cycling as a social phenomenon is addressed by the Ministry of Infrastructure and Water Management's initiative for global capacity building in active mobility.

The systems approach to social phenomena is a recognized expertise of several Dutch universities. Some universities specialize in applying the systems approach to cycling. They have identified a number of key factors that are crucial for analyzing and creating a cycling ecosystem.

The 2022 study on the earning potential of the Dutch bicycle sector has already highlighted how the Netherlands can strengthen and market its position as a bicycle country through cooperation between industry, government and knowledge institutions. In late 2023, partly as a result of this recommendation, the International Clean Energy Partnership (ICEP) program established an export group for the bicycle sector.[38] This group shares relevant developments and provides input for coordinating export requirements and international activities. Local governments abroad and the Dutch diplomatic network, such as embassies and Netherlands Business Support Offices (NBSOs), had, and still have, a strong need for more cooperation within the sector to act together internationally. This can be done, for example, through joint participation in tenders and in trade fairs.

International Trade Promotion for Cycling through ICEP

The Netherlands has a good reputation in the international renewable energy sector. Each sector is characterized by a great diversity of companies, from large market players to SMEs and start-ups. Through the International Clean Energy Partnership (ICEP) program, the government helps Dutch entrepreneurs in the sustainable energy sector to do business internationally. ICEP organizes activities such as trade missions and other events to showcase the sector. The program consists of several themes, including Sustainable Mobility International. One of the focus areas within Sustainable Mobility is the bicycle sector, with a particular focus on bicycle infrastructure and the production of e-bikes and cargo bikes.
RVO implements ICEP on behalf of the Ministry of Foreign Affairs. Activities for the bicycle sector are funded by the Ministry of Infrastructure and Water Management.

[38] RVO (2022). *International Revenue Potential Dutch Cycling Sector*.

The importance of a common international positioning and vision has already been mentioned. This could be done by appointing a so-called 'bicycle envoy,' similar to the approach of the Dutch water sector at an international level. This bicycle envoy could act as contact person and ambassador for the Dutch bicycle sector. This would not only strengthen the Netherlands' position as a leader in the global bicycle industry, but also contribute to sustainability, innovation and international cooperation. This would allow the Netherlands to promote its unique cycling ecosystem worldwide and play a leading role in integrated and sustainable mobility.

A strong, unified message about what the Dutch cycling sector has to offer can help win concrete contracts abroad and strengthen the international status of the Netherlands as a cycling country. This requires that all stakeholders within the sector, from bicycle manufacturers to infrastructure builders, consultants, government agencies, engineering and consulting firms, and academic institutions, join forces to jointly promote all aspects of the cycling ecosystem.

5.1 International Capacity Building

In the run-up of the COP28 (UN Climate Change Conferences), the Ministry of Infrastructure and Water Management, together with Belgium and Luxembourg, has taken the initiative to launch an ambitious program for global capacity building in active mobility. Within ten years, this program aims to train 10,000 local experts.

International Alliance for Capacity Building Active Mobility
ACTIVE, the Alliance for Cycling and Walking Towards International Vitality and Empowerment, is a 10-year alliance (2023-2033) that brings together key stakeholders in active mobility to strengthen capacity building and funding for walking and cycling worldwide. The goal is to train 10,000 professionals and establish a financing fund, with partners including WRI, UNEP, GIZ, UNESCO, and the Dutch Cycling Embassy. The program is initially co-funded by the Ministry of Infrastructure and Water Management, with additional co-funding from other countries over time.

Due to a growing awareness among governments of the importance of cycling and walking policies, but a lack of knowledge and funding, the ACTIVE program was launched by the Benelux countries at COP28 in 2023 to support the knowledge base in low- and middle-income countries in the Global South. In 2023, ACTIVE trainers visited countries such as Colombia, Ghana and India, and in 2024, workshops are planned in 12 countries, including Thailand, Peru and Uganda. These trainings will be adapted to local needs, culture, and context, while some standardization is inevitable as the workshops expand.

As transfer of knowledge is mainly from the Global North to the South, there is a risk that this well-intentioned transfer of knowledge may come across as pedantic. According to interviewees, it is therefore essential that capacity building is committed to adaptation to the local context and co-creation with local stakeholders from participating cities and countries. The active involvement of industrial and academic partners, as happens in the program, is crucial.

According to interviewees, two things are important for successful capacity building to increase effectiveness and impact[39]:

- Maximize co-creation work with relevant stakeholders. Use learning forms that evolve towards an integrative and iterative approach, integrating long-term learning pathways and citizen science models for sustainable results.

- Establish a robust evaluation process. This is necessary to ensure long-term effectiveness and sustainability. This should take into account the technical aspects and complex social dynamics within bicycle mobility.

This approach strengthens capacity building and ensures more integrated and inclusive knowledge transfer, which is critical to the success of global mobility solutions. Cultural sensitivity, deep local engagement, and effective strategies for sustainable knowledge transfer are necessary for the sustainable use of Dutch expertise in global capacity building.

[39] Interview Petzer; Interview Krizek. See also Glaser, (2021). *From Global Ideas to Local Action: Building Capacity to Reshape Urban Transport Policy.*

5.2 Five Factors for Creating Optimal Cycling Conditions

Dutch knowledge institutions play an important role in analyzing the mechanisms behind effective knowledge transfer. They also have expertise in the didactic aspects of disseminating and embedding cycling knowledge locally. They identify at least five main factors that are crucial for creating optimal cycling conditions.[40] These factors explain why cycling for daily use, recreation, or freight transport is flourishing in some cities while lagging behind in others. A preliminary analysis helps to estimate the potential. When analyzing the export potential of the Dutch cycling ecosystem, the following factors are important:

- **Cycling distances and urban landscape:** Compact cities with short distances between residential, work, and recreational areas encourage cycling. Historical periods of urbanization and suburbanization had different effects on cycling; suburbanization based on train and tram lines promoted cycling. Commuters took bicycles to and from stops. Later suburbanization based on cars and low-rise buildings discouraged bicycling. Recent trends of re-urbanization and compact urban design have reinvigorated bicycling. In other words, bicycle mobility requires spatial planning.

- **Cycling alternatives:** modal split analysis provides insight into mobility alternatives. These influence bicycle use. When public transit was expensive or inefficient, people used bicycles more often. The rise of the automobile in the post-war period displaced cycling. Recent policies to restrict cars and investments in public transit and cycling infrastructure promote cycling in urban areas. Policies and concession conditions may or may not encourage cycling.

- **Cycling as transport policy:** The attitudes of politicians, policymakers, and the public towards cyclists also have an impact. Negative perceptions have often led to the marginalization of cycling in urban policy. Positive images encourage the development of bicycle infrastructure and bicycle-oriented transport policies. Inclusion of bicycles in transport policies is a minimum condition for increased cycling, priority for bicycles stimulates a further increase in cycling.

- **Cycling and social movements:** Social and cultural movements have played an important role in shaping cycling culture and policy. Civil society organizations have repositioned cycling as a healthy, environmentally friendly and modern lifestyle. Their advocacy has resulted in better facilities, more bicycle-friendly infrastructure, and traffic calming measures. These changes in perception have had a positive impact on policy and investment in cycling infrastructure.

- **Cycling and cultural status**: How cycling is valued has a major influence. While in the Netherlands, unlike abroad, utilitarian cycling has held its own as a respected and full-fledged mode of transport, elsewhere cycling has increasingly been seen as a sign of lower economic status. Cultural associations of cycling as sustainable, healthy and modern, have contributed to the growth of cycling. The recent appreciation of utilitarian cycling as part of a sustainable lifestyle and urban development has positively influenced policy and culture around urban cycling.

[40] At the University of Amsterdam, Urban Institute, TU Eindhoven, global Cycling Cities, TU Delft and Tilburg, among others. For more information see: Oldenziel et al. (2016). *Cycling Cities, introduction.*

These factors are not independent; they influence each other and are influenced by local and global trends. It is the interaction of all these factors - not just one – that determines the level of success of urban, suburban, and rural cycling in everyday life. No single factor can fully explain the complexity of (non-) urban mobility and cycling culture. It is the unique combination and configuration of these factors over time that is decisive.

In conclusion, it is essential to consider a complex interplay in order to successfully export the Dutch cycling ecosystem. Dutch academic expertise can be of value here. It also requires customization and adaptation to the local context, as well as long-term thinking and iteration. In addition, international capacity building in active mobility brings export opportunities for Dutch companies operating in the cycling ecosystem, from bicycle manufacturers to cycling infrastructure.

6 Conclusion

Strong Starting Position

The Netherlands is recognized globally for its outstanding cycling expertise. This reputation is based on a strong domestic bicycle sector (as evidenced by numerical trends) and recent innovative mobility concepts such as OV-fiets, Lease a bike and Swapfiets, combined with forward- looking knowledge about (innovative) bicycle infrastructure and transport models.

Some of the world's largest bicycle manufacturers, such as Pon and Accell, are based in the Netherlands, highlighting its industrial capacity and innovative strength. The Netherlands is a leader in the development of integrated mobility services, contributing to the transition to sustainable urban mobility. Dutch engineering and consulting firms play a crucial role in the transfer of cycling expertise.

The adaptability of Dutch design principles to local conditions is enhanced by effective workshops. The emphasis on sustainability and corporate social responsibility is in line with global trends towards environmentally friendly transport solutions.

Continue to Seize International Opportunities

At the same time, the Dutch cycling ecosystem is not fully developed internationally as a unique brand. While domestic models such as the OV-fiets are successful, international expansion remains limited. Many bicycle-related innovations are dependent on national policies, making adoption in new markets difficult. Internationally, the Netherlands seems to focus mainly on urban, utilitarian cycling, while opportunities for recreational and freight cycling remain underexposed.

Cultural and market differences also complicate the direct applicability of Dutch cycling knowledge. In addition, Dutch consultancies are facing increasing competition from countries with similar expertise. Finally, financial constraints and staff shortages hamper the organization of workshops and local implementation of recommendations by agencies, reducing the impact of Dutch efforts. In this regard, the knowledge of Dutch universities on cycling ecosystems could also be better utilized.

Leader in International Capacity Building

The Netherlands is also a leader in international capacity building for active mobility. This is evidenced by the ACTIVE program of the Ministry of Infrastructure and Water Management in cooperation with international partners and the activities of the DCE. This position draws on the expertise of leading Dutch engineering and consultancy firms. Workshops imparting Dutch cycling knowledge provide brief insight into Dutch design principles.

It gives the Netherlands an influential voice in global mobility dialogues, for example through active participation in international coalitions such as the Transport Decarbonization Alliance and alignment in Europe and with the World Bank, WRI and UNEP, among others. The focus on active mobility at key conferences such as the COP also strengthens the Netherlands' position and influence in shaping global mobility strategies.

Strategic Approach Needed

In short, the Netherlands has traditionally had a thriving and innovative bicycle sector. Moreover, we have established a strong foundation for international capacity building in bicycle mobility, thanks in part to leading international coalitions and a rich history of innovation in bicycle infrastructure. To maintain and build on this lead, the Netherlands will need to navigate an increasingly competitive international market, requiring the sector to strategically innovate and redefine its unique value propositions. A strategic approach will help the Netherlands consolidate and expand its leadership in the global bicycle industry, with a focus on sustainability, innovation and international cooperation.

Four suggestions from experts to strengthen the Dutch bicycle sector's position

1. Strengthen European production base: The EU should support more initiatives that increase production capacity for a sustainable and circular economy, specifically for the bicycle industry, especially for small producers to adapt to new standards and strengthen their market position.
2. Support SMEs: Targeted support programs for SMEs in the bicycle sector are essential to meet new markets and regulations and to promote innovation and professionalization.
3. Research: More insight into the import and export of the Dutch bicycle industry and the foreign market is needed.
4. Mobilize knowledge institutions: Use the cycling ecosystem, the three cycling systems, and the five key factors as starting points for a strategy to strengthen the international position of the Netherlands.

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Dr. Frank Veraart, TU Eindhoven, Innovation Studies, Cycling, March 11, 2024
Wim van der Wijk, Haskoning, Sustainable Mobility, March 25, 2024
Professor Meredith Glaser, University of Ghent and Urban Cycling Institute

Steering Committee

Bert Zinn, Ministry, I&W
Maarten Mastop, BOVAG
Skadi Tirpak, Director Dutch Cycling Embassy

Research

Foundation for the History of Technology
Project leader Ruth Oldenziel (Eindhoven University of Technology) with the assistance from Harry Lintsen, Kazem Afradi, Jan Korsten, and Eric Berkers

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All pictures were used from the Mediatheek Rijksoverheid, except for page 16: Fulpra, page 20: Lease a Bike, page 23, 24, 26 and 28: Dutch Cycling Embassy

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