

# NETHERLANDS BICYCLE PARTNERSHIP FOR SUSTAINABLE AND SMART CITIES



## Foreword by Eberhard van der Laan Mayor of Amsterdam



Worldwide, the rapid growth of cities is both an opportunity and a challenge. There are many positive effects, such as new employment, innovations and social emancipation. At the same time, the daily mobility of these growing populations in large metropolitan regions is further burden on the accessibility, traffic safety, air quality and living environment of cities.

The development of cities in India is a perfect example of this dilemma. Year in, year out, cities such as Delhi and Bengaluru show spectacular economic growth, but at a price: traffic has literally come to a standstill. This is not only a cost to society, but also to the economy.

A sustainable solution involves a switch to other means of transportation. Amsterdam has shown that a transition in modalities of transport is possible. Forty years ago, the city struggled with serious congestion and parking problems, although not on the same scale as in India. Step by step, the bicycle has become the most important means of transport. Currently 53% of all travel in Amsterdam is by bicycle, compared to 23% by car.

Bicycles are fast, clean, healthy and inexpensive. I'm pleased to see that the Government of the State of Karnataka and the City of Bengaluru have discovered the bicycle as a means to speed up the transition to a sustainable, smart city. The Netherlands, and Amsterdam in particular, have a great deal of cycling expertise and experience that we want to share with other cities in the world. We have a shared responsibility to improve air quality and reduce CO<sup>2</sup> emissions.

The Ministry of Urban Development of the Government of India and the Ministry of Infrastructure and the Environment of the Government of the Netherlands have formalised this responsibility by signing a Memorandum of Understanding on Technical Cooperation in the field of Spatial Planning and Mobility Management. In the State of Karnataka and the City of Bengaluru, we hope to strengthen this cooperation by a partnership between Indian and Dutch companies, knowledge institutions and local government agencies, aimed at promoting cycling in cities.

In India, the Directorate of Urban Land Transport of the Government of Karnataka, and the Indian Institute of Science are to be congratulated for their vision in the support of this partnership. In this brochure the project and its Dutch partners are introduced.

I wish all involved parties success in this important and inspiring collaboration.

*E.E. van der Laan*

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Communication, design and infographics [www.meesterontwerpers.nl](http://www.meesterontwerpers.nl)

The Netherlands Bicycle Partnership for Sustainable and Smart Cities provides solutions for cycling in urban systems. This brochure introduces the partners. Together, they have the experience and expertise to develop a comprehensive strategy to promote and implement cycling as an inexpensive, efficient and sustainable mode of transport.

Many cities in India have expanded rapidly in the past decades. An accompanying widespread increase in motorization and lack of attention to land use transportation planning has resulted in extreme congestion in high density urban areas. The consequence has been a negative impact on accessibility, air quality, road safety and overall quality of life.

In 2013 the governments of India and The Netherlands signed a Memorandum of Understanding on technical cooperation in the field of spatial planning, and mobility management to exchange knowledge and develop solutions. In this framework, the Netherlands Bicycle Partnership for Sustainable and Smart Cities aims to support cities as Delhi, Mumbai and Bengaluru in the mobility challenges they face.

We offer an integral approach to planning infrastructure for safe cycling, ranging from urban architecture and design to project and stakeholder management. From streetcare and wayfinding to provision of bicycle parking and bicycle rental systems. From pavement design and construction to retail of conventional and upscale bicycles and electric transport bicycles. From social and societal aspects of measuring and influencing personal travel to community stimulation of bicycle use.

We address cycling in business districts, workplace and educational campuses, residential communities and touristic areas, as well as cycling for access to and egress from public transport as a seamless link in a multi-modal mobility chain for long-distance travel in large metropolitan regions. It is not a one-size-fits-all method, because local situations and challenges require tailor-made solutions. This way of working is inspired by the 'Smart City' approach that has been applied successfully in Amsterdam and across The Netherlands.

The state of Karnataka and the city of Bengaluru have expressed their desire to make urban mobility more bicycle-inclusive. We are delighted to have the opportunity to discuss this during the Amsterdam trade mission under the direction of Mayor Van der Laan, and look forward to a stimulating exchange of ideas with all involved parties. We hope this will be the start of a fruitful collaboration that will bring India smart, sustainable cities with better quality of life.



## Summary of mobility developments

- Over 2 million trips made daily in Amsterdam
- Less automobile use, more bicycle use
- Strongest growth in visitor traffic outside rush hour
- Moped use increases, but stays relatively low



**-23%**

Automobile use, 2006-2012



**-8%**

Public transport use, 2006-2012



**+13%**

Bicycle use, 2006-2012



**+10%**

Moped use, 2006-2012



**+62%**

Park & Ride use, 2006-2012



**+24%**

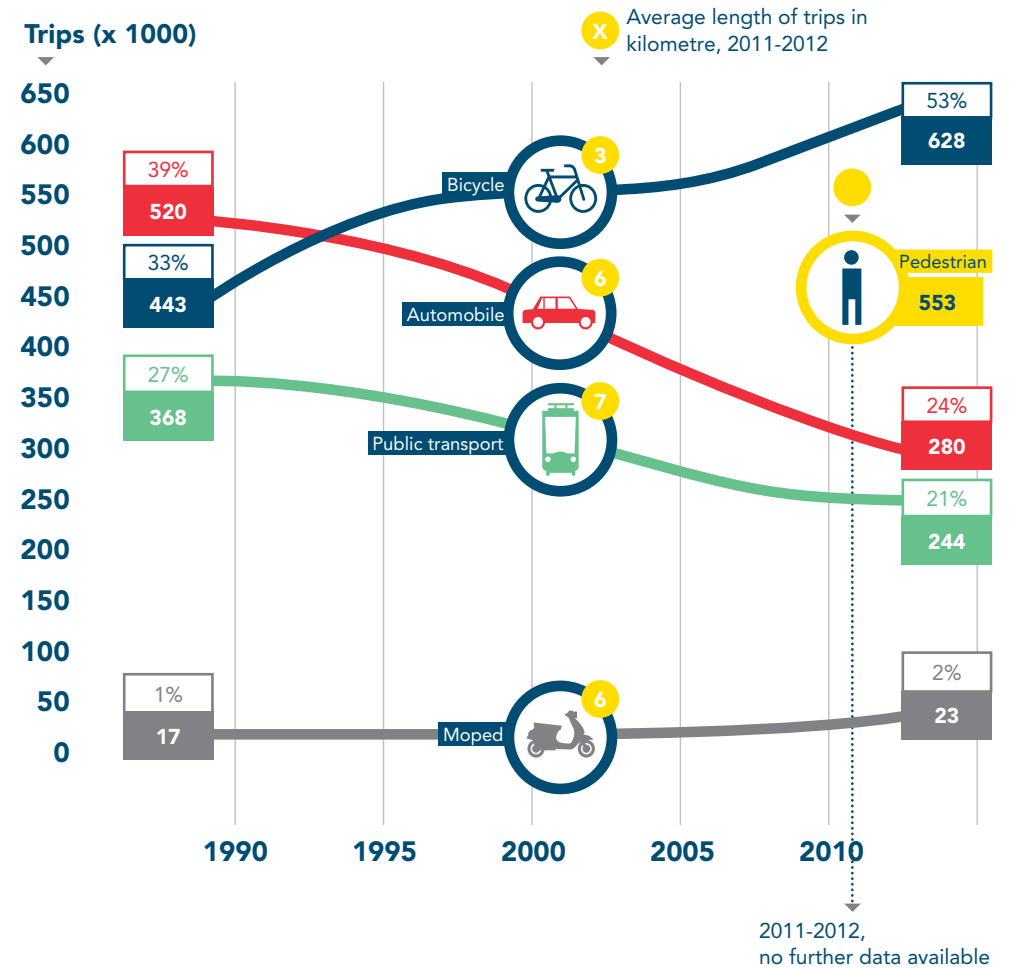
Ferry use, 2006-2012

Source: Municipality of Amsterdam



## Strong increase of cycling in Amsterdam

Number of trips (x 1000) per workday, by form of transport, 1989-2012



Source: Municipality of Amsterdam

In the past 25 years bicycle use in Amsterdam has increased by 43%, while automobile use fell nearly 50%. Smart city planning, investments in bicycle infrastructure and measures to minimize motorized traffic have contributed to this success. The designers and city planners of the municipality of Amsterdam can assist in implementing integral strategies for sustainable and smart cities. We can share our knowledge and help you draw up plans and policies for sustainable mobility, work out practical measures and design bicycle infrastructure for the Indian environment.

The work of the Municipal Department of Planning and Sustainability translates regional and long-term planning into the details of public space design. We search for new approaches and stimulate bottom-up processes to integrate solutions in the field of urbanisation, mobility and water management in multidisciplinary teams.



*A spectacular example of the recent extension to the cycle network is the Nescio bridge, which rises 11 metres above the Amsterdam-Rhine canal to allow ships to pass below it. With a total length of 780 metres and a 1:40 slope, the construction ensures a comfortable climb for cyclists.*

photo: Edwin van Eijs

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Logistics is one of the key research areas of the Center for Mathematics and Computer Science (CWI). The focus is on modelling, analysing and solving problems in management of road traffic and congestion phenomena. CWI looks beyond methodological aspects and has a long-standing tradition in applying research results. It is part of an extensive international network of collaborations with industrial partners and governmental and academic institutions. CWI's role in the project will be to develop, analyse and optimise of dynamic traffic and congestion models.

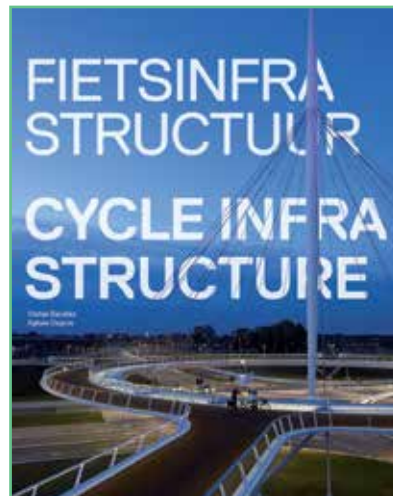
The Center for Mathematics and Computer Science, founded in 1946, is an internationally renowned research institute in Amsterdam. Logistics and traffic management are among the key areas of interest. For their ground-breaking research on optimizing train schedules, researchers at CWI received the highly prestigious Franz Edelman Award from INFORMS, the world's leading society in Operations Research and Management Science.



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Artgineering devises and implements strategies for complex urban conditions, with attention to the role of infrastructure and particularly bicycle facilities. Starting with precise observations of the existing territorial realities, including innovative participatory processes, the office investigates the spatial, social and cultural production of space. Artgineering will bring the expertise, services and products of the project partners together in strong, yet context-specific, spatial design proposals and oversee the pilot projects.

Artgineering is an urban planning office for research and design at the intersection of urban planning and mobility. Through a holistic approach combining creativity and technology (hence art-gineering), we reinterpret the relation between infrastructure, landscape and urban development. Major works are the publication *Cycle Infrastructure* (2013) and the study *Cycling Nation* (2014), the latter commissioned by the Dutch Ministry of Infrastructure & Environment.



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The Urban Cycling Institute applies a structured and multidisciplinary approach to map the complex social and spatial dynamics of urban cycling. It actively fosters reciprocal learning between research and practice through critical analysis and constructive application of knowledge. Bengaluru is a city that offers a rich context for understanding the opportunities and threats for cycling as mainstream means of urban transport in a global city context. This project also allows us to actively engage in a real transition trajectory.

The Urban Cycling Institute is part of the Center for Urban Studies of the University of Amsterdam. It aims to bring knowledge on cycling from science to practice and back.



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We design, organize and lead international 'Think Bike' workshops for public authorities, stakeholders and (political) directors to encourage cycling and to exchange knowledge and best practices, with tangible results and highly satisfied participants. APPM is interested in sharing knowledge on sustainable mobility, and to help initiate new projects to encourage bicycle-inclusive mobility in Bengaluru. We are looking forward to making new contacts.

With a team of 60 managers and consultants, APPM Management Consultants aims to improve the quality of the physical environment. Our strength lies in our professional, enthusiastic and practical method of realizing goals. Our main fields of expertise are infrastructure, mobility, spatial development, real estate, water, energy and climate. Through planning, development and restructuring we pursue a beautiful, climate resilient and sustainable country. APPM has extensive experience in consultancy and in project and process management.



In June 2014 the Directorate of Urban Land Transport of Karnataka, the Transportation Research Group of India and e/du Project Management and Consultancy organised a two-day workshop 'Sustainable mobility: Planning of Infrastructure for Safe Cycling'. The primary goal was to identify how cycling can be promoted as an everyday means of transportation through research, capacity building, training and implementation, and to sketch an agenda for collaboration between Karnataka and the Netherlands.

Founded in 2005, e/du Project Management and Consultancy is dedicated to networked science: connecting continents, cities and sectors. We link ICT with infrastructure & spatial planning, engineering & consultancy, metropolitan governance and research & higher education.

Given an unprecedented rapid rate of urbanization and motorization currently taking place around the world, it is critical to leap-frog to state-of-the-art clean solutions. e/du aims to develop a platform that facilitates multi-actor communication, collaborative decision-making and learning-at-a-distance, so that world-class innovative knowledge and experience may be globally accessible.



**Rutte Groep is based in Amsterdam, the cycling capital of the world. That's why our operating company Rutte Wegenbouw specialises in of bicycle lanes construction. We look forward to bringing this experience and expertise to Karnataka.**

Rutte Groep is a family owned business, with a history spanning more than 60 years. We are civil contractors and construction material producers in Amsterdam. We strive to provide our customers with the highest standards of quality, value, and service on every project.



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**MB Bicycle Parking is one of the intelligent solutions that HR Groep can offer India. The patented bicycle parking rack is unique in offering the following benefits:**

- front fork securing protects the front wheel against bending
- bicycles are stored upright
- all types of bicycle fit in
- user-friendly and vandalism-proof

**Additionally, MB Bicycle Parking can be delivered with a track-and-trace system. A smartphone app allows cyclists to check for available parking spaces, and provides parking facility managers with occupancy information. HR Groep Track&Trace won the Amsterdam Intertraffic Innovation Award in 2014.**

HR Groep is a Dutch family-owned company, established in 1972 as 'Holland Reliëf', providing (in-house produced) solutions in the areas of 'Traffic', 'Streetcare' and 'Wayfinding'. HR Groep has subsidiaries in the Netherlands, Germany and Belgium.



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Callock is an advanced, flexible and automatic bike-share system for bikes and tricycles. Callock can operate on solar energy. The rental units have a wireless connection with a web-based management and information system. Users don't need cash or dedicated cards - they can pay safely and easy with their mobile phone or smart card. Callock can fill the missing link in the mobility chain in Karnataka: the first and the last mile travelling by public transportation.

Callock-International is a formidable international player that develops, produces and maintains creative solutions for sustainable mobility, specialising in bike-sharing. Over 22 cities and companies are using our turnkey solutions. With our team and global partners, own research and production facilities and a customer-oriented project and service organization, we are always glad to help you out.



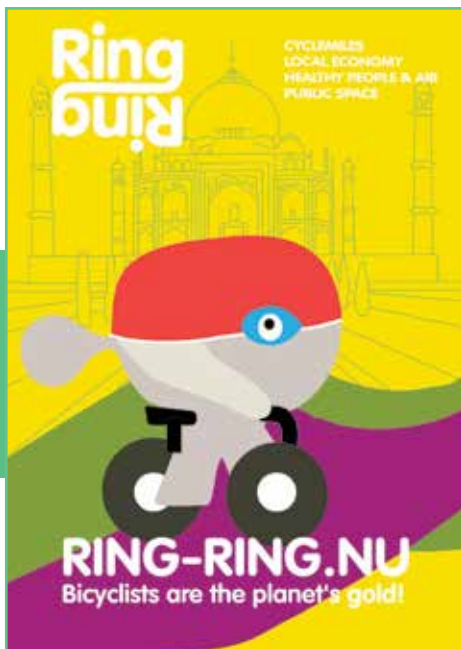
The Urban Arrow is the transport bicycle re-invented. An electric cargo bicycle, built with the newest technology and state of the art materials. It's fast, immune to traffic jams and carries a surprising amount of freight. For the city the Urban Arrow is the perfect green alternative to a car or small van. It doesn't emit any CO2, or any other toxic particles, and moves without a sound. Urban Arrow can create a better living environment and smarter urban mobility for Karnataka.

The Amsterdam based Urban Arrow is continuously developing, testing, and improving its bicycles and accessories to make the cycling experience as satisfactory as possible. The goal is to make the best electric cargo bicycle in the world. That's why Urban Arrow is currently doing business in 11 countries and received two international awards, in 2010 and 2013.





Ring-Ring is an easy-to-join community for bicyclists and four specific stakeholders that benefit from cyclists: healthcare, (local) government, retail and employers. CycleMiles travelled by bicycle are measured on a smart device and converted into a value for each participating stakeholder. Gamification elements push intrinsic motivation. The data cyclists gather with their smartphones are shared in an open platform with the highest respect for privacy. The data will attract SMART people to invent SMARTER cities where people are able to thrive. Where people thrive, economies flourish! A healthy mobility choice solves three major problems, in Karnataka and the rest of the world: health, air quality and public space dilemmas. Each CycleMile is a gift. Think about it!



Ring-Ring is a social enterprise that is globally scalable, locally relevant. Ring-Ring is powered by Mobidot. Mobidot is a young, innovative company specialising in automatically measuring personal travel behaviour using the smartphone and creating personal mobility profiles. quality, value, and service on every project.

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Amsterdam Smart City (ASC) is a public-private partnership with the ambition to develop the Amsterdam Metropolitan Area as a smart city. The partners are businesses, government authorities, research institutions and the people of Amsterdam. In a smart city, investments do not deplete natural resources, but fuel sustainable economic growth and improve the quality of life.

Founded in 2009, ASC has grown into a wide-ranging platform with over a 100 partners. Together, they are involved in projects ranging from urban planning and local energy production to open data and sustainable mobility. The key to this success is the ability to bring partners together in local projects. With this collaborative approach, ASC functions as an urban lab for new initiatives that aim to improve quality of life. As India has the ambition to build 100 smart cities, ASC is keen to partner with Bengaluru and Karnataka on such topics as smart mobility, urban planning and cycling infrastructure.

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Amsterdam's first bicycle sharing scheme in 1999, designed by Luud Schimmelpennink.



## Most trips in Amsterdam by residents on bicycle

Number of persons per target group and their travel choices on an average workday, 2012

Number of persons per target group

790.000



2,9

Residents  
Trips per day

Mobility choices per target group



Based on data from residents 12-80years old

315.000



2,2

Visitors  
Trips per day

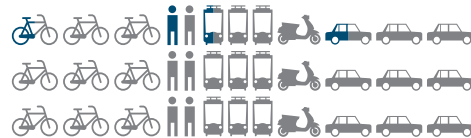


27.000



4,0

Tourists  
Trips per day



Coloured symbol signifies 100.000 trips by choice of transport per day

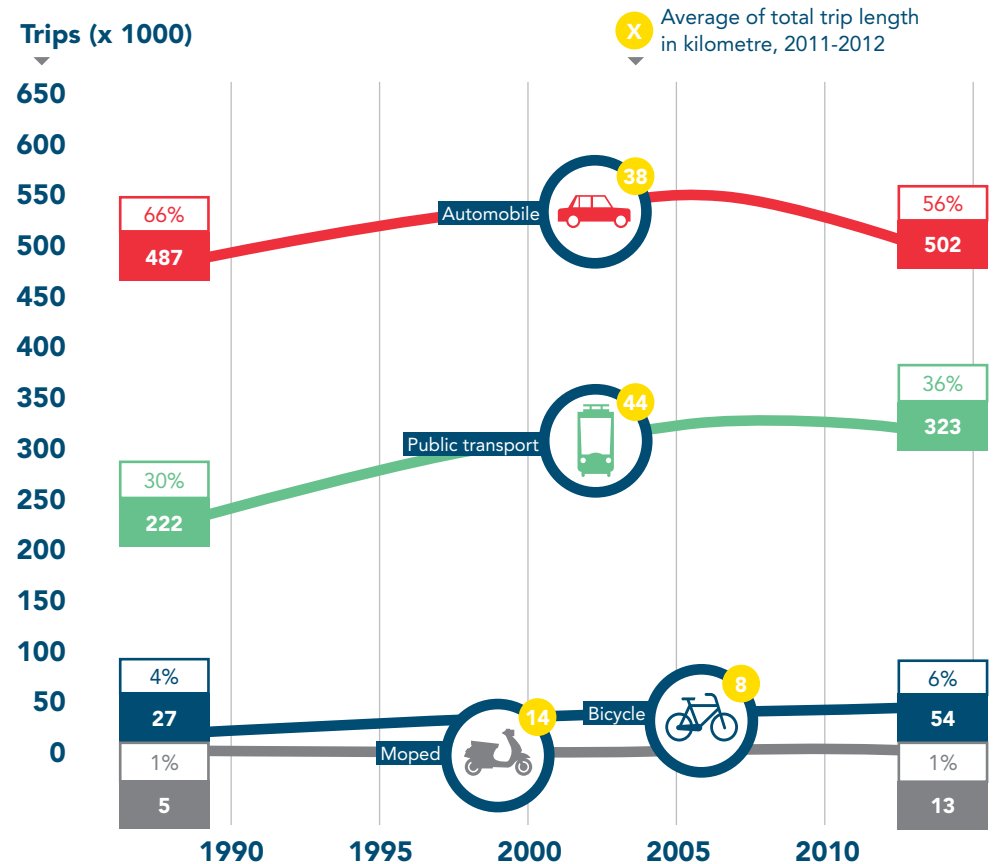
Source: Municipality of Amsterdam



## Visitors travel more by public transport and less by car

Number of trips (x 1000) to and from Amsterdam per workday, by means of transport 1989-2012

Trips (x 1000)



Source: Municipality of Amsterdam



**DELHI/BENGALURU/MUMBAI**  
**MARCH 23<sup>TH</sup>-27<sup>TH</sup> 2015**

