Delhi 2050

towards integrated long term planning for a sustainble metropolitan region

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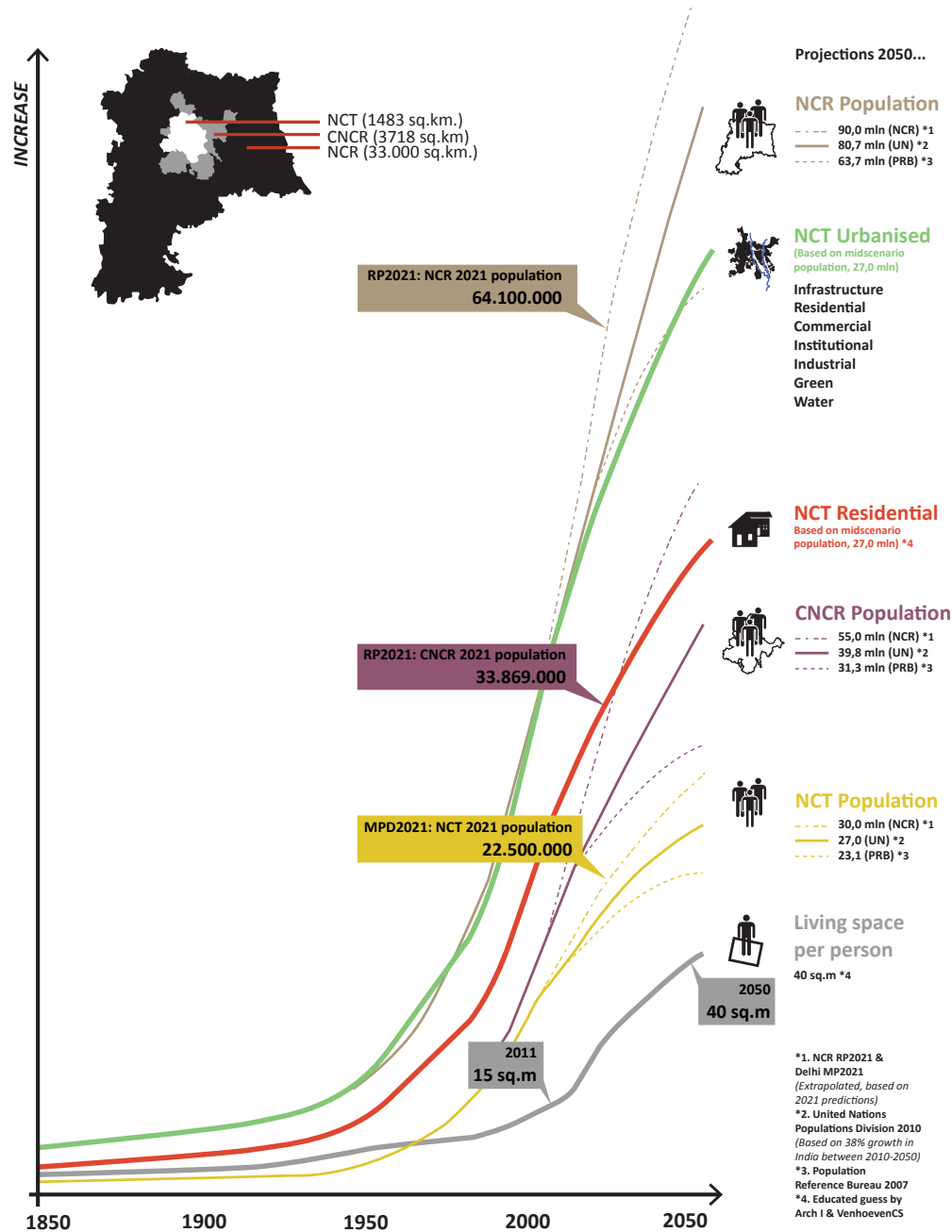NL-1018BH Amsterdam
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What is Delhi 2050?

- Delhi 2050 is an initiative aimed at improving the quality of life in Delhi 2050

- Delhi 2050 deals with the economic, social, environmental and political challenges related to population growth and economic development by making use of the advantages of long term planning

- Delhi 2050 complements existing Indian master planning with public participation, the results of international scientific research, data mapping and the Dutch Approach to long term planning

- Delhi 2050 believes that creating public awareness for the long term future of a city will contribute to developing a shared vision for the future

- Delhi 2050 makes use of all available sources of data; from UN reports to local newspapers and from government plans to field research. Through infographics and attractive maps these data are made readable and available to broader audiences

- Delhi 2050 makes use of thematic approaches to discuss the challenges Delhi is dealing with and to explore possible responses to these challenges

- Delhi 2050 uses design prominently in the vision making process: as a tool for research, debate, decision-making and in the search for alliances

- Delhi 2050 was presented in the international context of the 5th International Architecture Biennale Rotterdam in April 2012

- Delhi 2050 has developed into a joint effort of Indian and Dutch government planners, urban designers and researchers and experts from the fields of spatial planning, urban and economic development, environmental and social studies

- Delhi 2050 wants to become Indian Urban Futures 2050!

- Delhi 2050 helped paving the way towards an MoU on cooperation in the field of integrated urban planning which will be signed by the Indian Ministry of Urban Development and The Dutch Ministry of Infrastructure and the Environment

why Delhi needs a long term vision

INCREASE

NCT (1483 sq.km.)
CNCR (3718 sq.km)
NCR (33.000 sq.km.)

Projections 2050...

NCR Population
- - - 90,0 mln (NCR) *1
—— 80,7 mln (UN) *2
- - - 63,7 mln (PRB) *3

NCT Urbanised
(Based on midscenario population, 27,0 mln)

Infrastructure
Residential
Commercial
Institutional
Industrial
Green
Water

RP2021: NCR 2021 population
64.100.000

NCT Residential
Based on midscenario population, 27,0 mln) *4

CNCR Population
- - - 55,0 mln (NCR) *1
—— 39,8 mln (UN) *2
- - - 31,3 mln (PRB) *3

RP2021: CNCR 2021 population
33.869.000

NCT Population
- - - 30,0 mln (NCR) *1
—— 27,0 (UN) *2
- - - 23,1 (PRB) *3

MPD2021: NCT 2021 population
22.500.000

Living space per person
40 sq.m *4

2050
40 sq.m

2011
15 sq.m

*1. NCR RP2021 &
Delhi MP2021
(Extrapolated, based on
2021 predictions)
*2. United Nations
Populations Division 2010
(Based on 38% growth in
India between 2010-2050)
*3. Population
Reference Bureau 2007
*4. Educated guess by
Arch I & VenhoevenCS

1850   1900   1950   2000   2050

different projections for the increase in population, living space and built up area from different sources

Delhi currently houses around 17 million[1] people. The population has been growing with a staggering 50% each decade since 1950. Since 2000 this growth has slowed down to a still impressive 21% or 2.800.000.000 people between 2000 and 2010. The greater Delhi urban region (National Capital Region) has currently around 40 million inhabitants on 33000 sq.km., making it one of the world's most populated regions.

This increase in population puts immense pressure on the city in terms of energy and water supply, infrastructure and (public) space. In addition there is an even more rapid growth of the number of middle class households and their increasing demand on mobility, housing, leisure and consumer goods. Especially the middle class is becoming more and more critical on the environment they live in, since they are in a position to choose where to live and work. It's therefore vital for Delhi to start thinking about its ambitions for the long term future.

The demands of the future - the growth of the population, economic growth, consumption, car use, household size etc. - cannot simply be calculated based on statistics and historical developments. Especially in today's global economy there are countless factors which cannot be controlled. Therefore it's important both to define long term ambitions such as the desired quality of life in the city and to distinguish certain and uncertain developments. The current planning practice in India lacks the capacity and experience to deal with the expected immense growth of population and prosperity, the pressures on space and the city this gives and the uncertainties of future developments.
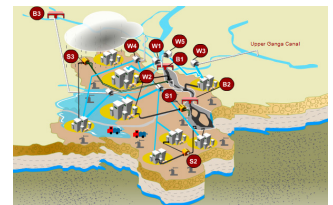
current water-related issues in Delhi: ground water depletion, monsoon floodings, insufficient treatment capacity and polution of the river.
www.rainwaterharvesting.org

This was the reason that in 2009 a project was initiated to reflect on and discuss about the long term future and ambitions of Delhi. Delhi 2050 invited Dutch designers, experts and planning professionals to share the expertise of the Dutch century-long integrated planning tradition coined recently as The Dutch Approach. By combining this approach with Indian planning instruments and scientific research, future scenario's where developed, tested and debated with both a local and international audience.

due to congestion people have to travel up to three hours to reach work

Delhi 2050 is the starting point of formulating its ambitions for the long term future. But it is only the starting point, much work still needs to be done. Research, planning, communication, but most importantly execution of all the dreams. This is all not just to turn Delhi into a sustainable and competitive metropolis but also to transform the region into a metropolitan conurbation with a high quality of life.

invitation for public presentations and debates for Delhi 2050 phase 1, May 2011

public expert sessions for Delhi 2050 phase1, May 2011

displaying differnt thinking models of Delhi 2050 phase 1on traditional pushkarts in public spaces of Delhi

Delhi 2050 is about creating an inclusive, sustainable future for the metropolitan region of Delhi. Thinking about the future of the city is not everybody's daily practise. But to generate a sustainable future for a city it is essential to gain widespread support. To get this support it is necessary to create awareness and to convince people that the work being done is in their own interest. There are different groups of people necessary to reach, using different approaches to attract these groups. Delhi 2050 for example started in March 2011 with a series of very diverse events in public places in Delhi.

In these activities we involved both Indian and Dutch experts on mobility, environment, anthropology and urbanism, but also the creative sector like artists, graphic designers and architects, both local and Dutch. Dutch and Indian government planners and officials gave their input during the different events. Most events were open to the general public so students and other citizens could join in.

Workshops, debates and lectures were organised to discuss the future of Delhi with professionals and an interested audience. To involve a more general public to learn about their ambitions and views on the city, street interviews were conducted and a mobile exhibition of different thinking models was set up.
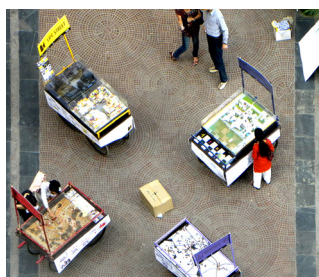
To get as much Delhi as possible into the events, the venues for all these events were public places in Delhi itself: Sometimes in more exclusive spaces like the plazas of professional and academic institutes like the School for Planning an¬d Architecture, Centre for Science and the Environment and the India habitat Centre. In other occasions real public places were chosen, as for example the Old City, Hauz Khas Village, AIIMS flyover, top of the Statesman Building, Kashmere Gate, Nehru Place, Lodia Garden and Dilli Haat.

creating awareness

international network

Delhi 2050 was invited to take part in the prestigious International Architecture Biennale Rotterdam (IABR). With a large exhibition in the Netherlands Architecture Institute (NAi), the IABR displayed the explorations of this international platform for urban collaboration.

Delhi 2050 showed the results of the above process in a 36sqm information box. This box has also been displayed at Cornell University in New York. In 2013, it will also be presented in Delhi. Besides this, various presentations and lectures about Delhi 2050 have been given in both The Netherlands and India.

opening of 5th IABR by Melanie Schultz van Haegen, Minister of Infrastructure and the Environment, Government of the Netherlands, accompanied by Mr. Ahmed Aboutaleb, Mayor of Rotterdam and representatives from Sao Paulo and Istanbul.

impression of the main exhibition of 5th IABR at the Netherlands Architecture Institute in Rotterdam
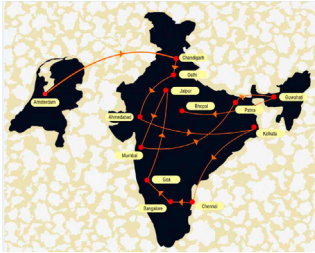
the travelling exhibition and debate series of 'Indian Visions Dutch Methods' in 2009-2010

public presentation of the workshop results of phase 1 on traditional pushkarts in Delhi, spring 2011

phase 2 workshop in Amsterdam, november 2011

production during a week of workshops in Delhi, January 2012

Cultural exchange

Delhi 2050 was sparked by an ARCAM initiative under the name "Indian Visions Dutch Methods", that brought together Dutch and Indian architects and designers, resulting in a travelling exhibition in India that went to 13 cities.

Phase 1: Public Awareness

From this initiative, Delhi 2050 phase 1 started in 2010 with the goal to create more public awareness on the topic of the future of Delhi. The process followed a participatory and multi-disciplinary approach, using public debates, academic research and the input from a variety of experts. This phase ultimately culminated in four spatial ideas for the transformation of Delhi represented as architectural models on traditional pushcarts in various public locations in Delhi.

Phase 2: Building alliances and exploring the issues and possible solutions

In phase 2 of Delhi 2050 these explorations and collaborations were further elaborated and formalized with the help of a network of Dutch and Indian participants. Experts, consultants, government officials, planners and designers from both India and The Netherlands were brought together to discuss the current and future challenges Delhi is facing and to explore the strategies and solutions. The people involved in the process were representing all the organisations needed to form an alliance. Based on the Dutch Approach as developed among others for national planning, such an alliance is necessary to make long term urban planning feasible. The participants, coming from both governmental and educational institutions and private industry joined forces in workshops in both Delhi and Amsterdam in late 2011 and early 2012. The results of these workshops were displayed at the 5th International Architecture Biennial Rotterdam (IABR), held from April until September 2012 and officially opened by Melanie Schultz van Haegen, Minister of Infrastructure and the Environment, Government of the Netherlands.

process of Delhi 2050; from cultural exchange to sustainable collaboration

Current developments

During the second phase of Delhi 2050 the project came under the attention of the Indian Ministry of Urban Development. Several presentations and meetings with the concerned officials have led to an official collaboration between the Indian Ministry of Urban Development and the Dutch Ministry of Infrastructure and the Environment. A Memorandum of Understanding (MoU) will be signed by the two concerned Ministers early 2013. An accompanying working program will include collaboration in the fields of spatial planning, water- and transport management, energy efficiency and sustainable cities.

With this MoU in place the ambition is to explore how to incorporate this into Indian planning and spatial development using the method of Delhi 2050 based on the Dutch Approach. Pilot projects of different scale and impact (regions, cities, neighbourhoods) will be initiated to test the incorporation.

meeting of Indian and Dutch government officials to discuss future collaboration. From left to right: Mr Shrivastava (vice-chairman Delhi Development Authority), Mr Singh (Indian Embassy The Hague), Mr Kshirsagar (Chief Planner Town and Country Planning Organisation) and Mr Henk Ovink (Director General Spatial Planning and Water, Dutch Ministry of Infrastructure and the Environment)
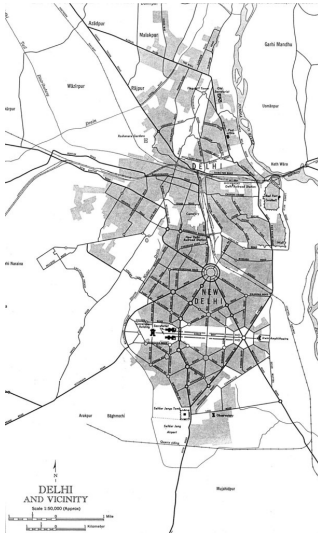
Delhi and New Delhi, around 1912
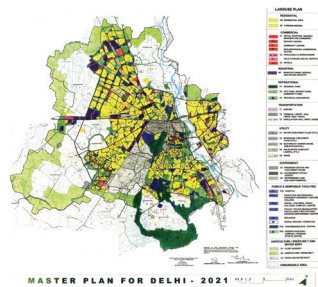
Proposed land use for 2021, Master Plan 2021

MP2021: "Delhi a world class city..."
The city of Delhi has a planning history of already more than a century, since the planning on Lutyens' New Delhi started in 1905. Since then there were different master plans for the National Capital Territory (NCT) and later also for the National Capital Region (NCR). These plans were based on thorough research and data and gave a complete and comprehensive view on what developments would be necessary to deal with current and future challenges the city and urban region are facing.

Some excerpts from the Master Plan 2021 on Housing, Water and Transport:

Housing
'Studies based on redevelopment potential of existing residential areas and the actual population as per census 2001 have revealed that the present urban limits (...) would be able to accommodate about 153 lakh (15,3 million, ed.) population ultimately ... Therefore about 48 lakh (4,8 million, ed.) additional population is to be accommodated in the future urban extensions.'

Water
'The broad objective of the work (NCR functional plan for groundwater recharge, ed.) is to formulate technically viable proposal enabling funding agencies to implement a comprehensive and scientifically viable water conservation, artificial recharge and rain water harvesting program in the entire NCR, on loan/grant basis.'
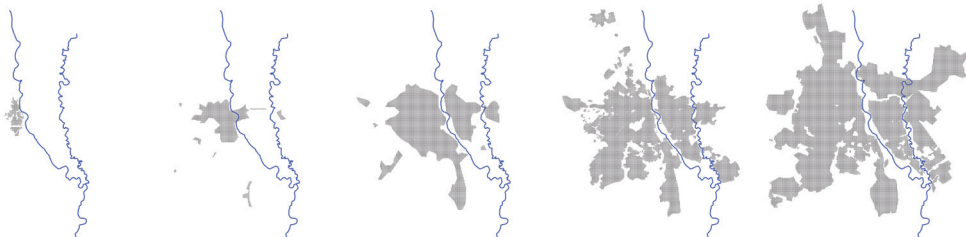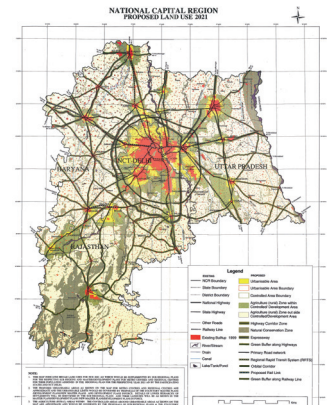

growth of Delhi in the last century until 2021 (proposed)

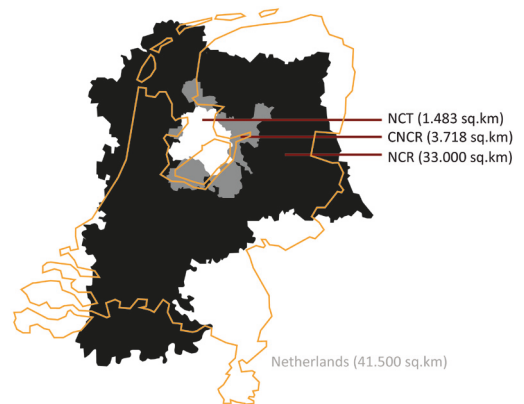# combining Indian expertise and Dutch experience

Infrastructure

'The broad aim... would be to ensure safe and economical commuting between place of origin and destination, convenient and quick access to all areas for all sections of the society, reduction of pollution and congestion, energy efficiency and conservation, safety for all sections of the road and transport users and, towards meeting these objectives, providing a significant increase in efficient rapid public transport systems and facilities with a corresponding reduction in individual private transport usage. This is in addition to pedestrianisation and properly planned use of non-mechanised transport systems in specific areas.'

Improving the Indian planning process

The plans for Delhi, drafted by among others the Delhi Development Authority and the National Capital Region Planning Bureau are well made and very necessary, but they seem to have little grip controlling the rapid expansion of the city. How could this planning process be improved to be more effective? Should the planning be more informed with bottom-up initiatives, should the planners have more mandate to put their plans into practice and transform it into policies, should the scope of planning be longer and what role should (urban) design play in this process? This is where the Dutch approach on spatial planning could be of added value. Not so much on the content of the plans, but more on what steps should be taken to come to a shared, long term and integral vision on a sustainable Delhi.

National Capital Region Regional Plan 2021

NCT (1.483 sq.km)
CNCR (3.718 sq.km)
NCR (33.000 sq.km)

Netherlands (41.500 sq.km)

difference in scale of planning between the Netherlands and India

Ontwerpen aan Randstad 2040

Designing
Randstad 2040

Design and Politics #2
010

The Netherlands has a long tradition in spatial planning based on spatial visions. This has been forced by the Dutch fight against water and the gaining of land (the 'polder'). Since the 1950s many national, regional and local vision documents came into being. Essential to the Dutch approach of vision making are creating alliances of power and using design as a tool. This asks a new role for governments.

The 'Dutch Approach' of planning is an active one. It means listening to and communicating with the people who are involved, who represent the different challenges and tasks and who share the ambition to make a difference. It means scanning, envisioning and modeling the future, to be prepared for upcoming challenges and opportunities. The Dutch do not work five years ahead, not ten, but at least forty. Planning means being prepared, because solutions take time and need long term consistent policy and implementation. Dutch planning means integration of themes and searching for multi-purpose solutions. It means planning by design, through different (time-) scales and layers of occupation (including cultural heritage), networks (infrastructure, water system, energy etc.) and the physical and natural base.

The long Dutch experience in long term planning might be a help in the complex urban situation of today that needs more than ever a practice of planning ahead by vision making, developing instruments and implementation. Important in this case is that these processes go along parallel lines, instead of being executed one by one.

As shown above the Netherlands has a planning tradition of cooperation, making alliances between governments, the private sector and the public. It also has a tradition of integral planning - which means the opposite of sectorial planning -

method:
the Dutch Approach

international orientation and sustainable land use. This is most visible in the integration of urbanization, dealing with water, mobility, economic development, agricultural use and nature in the visions since the 1950s. Now the world is facing major challenges in its urban development, it seems that the Dutch planning tradition offers a helpful tool to deal with the complex questions of today.

This tradition involves a method of planning that is called 'the Dutch approach'. This Dutch approach consist of four necessary ingredients:
1. Creating alliances of power between public bodies, the private sector, knowledge and society at large;
2. Using design as a tool for research, debate and decision-making.
3. Elaborating an integral spatial vision: sustainable, flexible, socially based and feasible;
4. Balancing governance: the right combination of vision, instruments and real projects;
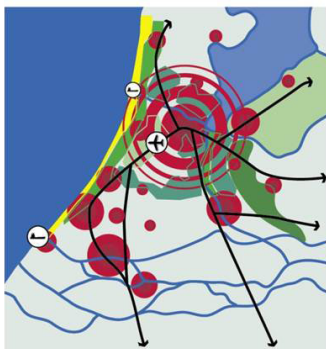

historical map of Holland showing the precarious situation of this now urbanised delta
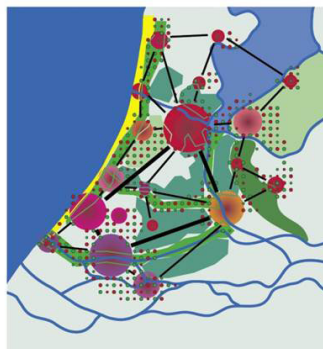Hollandiae Antiquorum Catthorum Sedis Nova Descriptio
Abraham Ortelis, Antwerp 1574
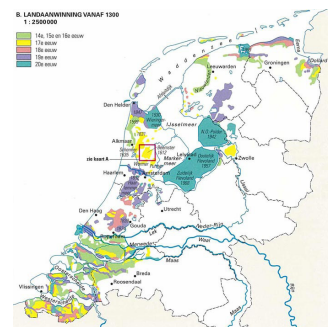
reclaimed land since 1300
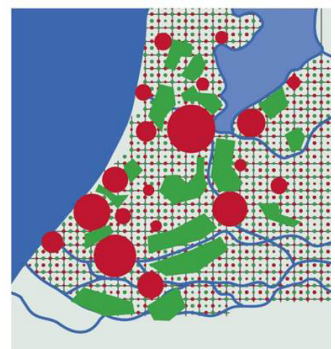

RANDSTAD CENTRUMSTAD   **RANDSTAD STEDENSTAD**   **RANDSTAD PARKSTAD**

three spatial models investigated in the Randstad 2040 process: centre city, cities city and park city

Delhi 2050 is a collaboration of Indian and Dutch government planners, architects, urban designers, specialist in the field of water, mobility, sustainability and university researchers. This is based on the principle of the triple helix or golden triangle, alliances formed between government organisations, knowledge institutes and business, very common in Dutch planning tradition.

These alliances are not only to create the vision but also to put this vision into practice. In an increasingly urbanised world the roles and responsibilities of every single member of the alliance involved is changing constantly. Instead of working in the abstract space of administration and bureaucracy, politicians and governments initiate conversations with all other stakeholders in spatial planning; both public and private. All stakeholders take an active stake in the alliance, working towards a common goal while at the same time taking responsibility for his or her own part and trusting each other for that part, acknowledging ambition and position of all parties.

organisations involved in Delhi 2050

VenhoevenCS
architecture+urbanism

TUDelft
Delft University of Technology

भारतीय प्रौद्योगिकी संस्थान दिल्ली
Indian Institute of Technology Delhi

MOD Institute
Bangalore & Berlin

ashok b lall architects

Deltares
Enabling Delta Life

Grontmij

DUtch
► design ► fashion ► architecture

REGIONAL PLAN

archi
exploring design

IADR
INTERNATIONAL ARCHITECTURE BIENNALE ROTTERDAM

bosch stabbers
LANDSCAPE + URBAN DESIGN

IHS
Making cities work
Erasmus

WAGENINGEN UR
For quality of life

UNIVERSITY OF TWENTE.

ITC

Ministry of Infrastructure and the Environment

TNO innovation for life

romi khosla design studio

# method:
building alliances

In Delhi 2050 we built an Indian-Dutch alliance of governments, designers, experts and academics. The people involved were specifically approached for their experience, expertise or knowledge on one of the thematic scenarios; people, planet, profit. So within every theme, there were designers, experts, government planners and other professionals from both countries.

The Alliance of Delhi 2050
The Alliance of in Delhi 2050 was built between: Bosch Slabbers landscape architects, Deltares, DutchDFA, Grontmij, ITC/University of Twente, Ministry of Infrastructure and The Environment, TNO, TU Delft and VenhoevenCS architecture+urbanism in the Netherlands. In India were personally involved: arch i Platform, Mr Suresh Rohilla (Center for Science and Environment), Mr Ashok Lall (Ashok B Lall Architects), Mr. Romi Khosla (Romi Khosla Design Studio), Dr. Manju Mohan (Indian Institute of Technology), Mr Alok Jain (MVA Asia), Madhav Raman (Anagram Architects), Dr. Jyoti Parikh (IRADe), Dr. Amitabh Kundu (JNU), Dr. Geetam Tiwari (TRIPP), Prof. Mahavir (School of Planning and Architecture), Delhi Development Agency, National Capital Region Planning Board and the Indian Ministry of Urban Development.

method:
design as a tool
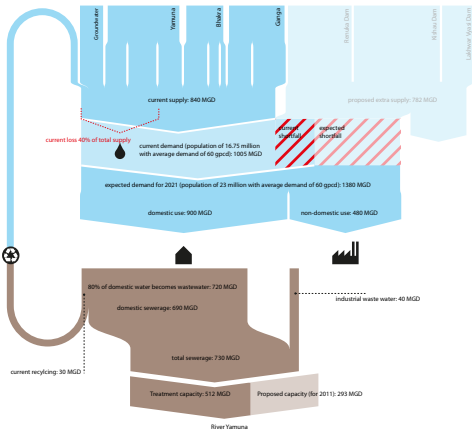
diagrammatic display of current and
planned water supply and demand
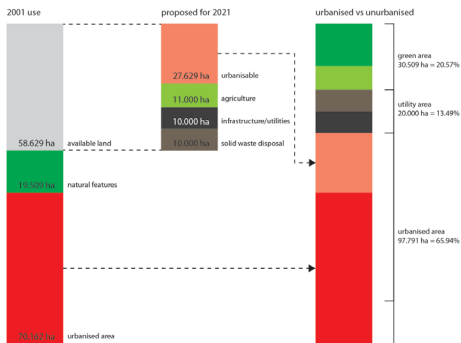
current and projected land use in NCT

design studio

Design has an important position in the vision making process. It works as a tool for research, debate, decision-making and search for alliances.

For Delhi 2050 a design studio was set up to produce the material that was used for interactive workshops and debates in both India and The Netherlands. The design studio was responsible for visualisation of the data, the animation of the thematic scenario's and possible solutions for the test sites.

research

The studio investigated the challenges Delhi is facing today and in the foreseeable future, trend reports and the plans which already have been made by government planning bodies.

To get the data right we went through, among others, Census India 2011, the Delhi Masterplan 2021, the regional plan 2032 for the National Capital region, expert presentations, reports from McKinsey Global Institute, UN Habitat, local newspapers and of course field research and aerial photographs.

The large amount of data available was translated into illustrative material as for example infographics, diagrams, schemes and maps. These helped to make the data suitable for interpretation, presentation and discussion.

method:
scenario building

To explore different futures for Delhi and possible development strategies leading to them, in phase 2, Delhi 2050 worked with scenarios, combining spatial, economical and social elements. These scenarios were conducted as integrated design studies, resulting in images and maps.

Delhi 2050 created three different thematic scenarios; People, Planet and Profit. Each scenario had a different focus and approach. People was about creating an inclusive city by means of integrated spatial planning and design; Planet investigated the possibilities of integrated centralised and decentralised water systems and create attractive public space by doing so; Profit combined mass transit systems and nodal development to decongest the city.

The scenarios were tested on two specific test sites in Delhi; the Old Delhi area around Kashmere Gate station and the New Town of Dwarka.

themes and subjects which were explored in Delhi 2050

discussion during a design workshop in Delhi, January 2011

themes

people

How can we use integrated spatial planning and design to work towards a healthy and sustainable future for the city?

The major challenge is how to secure quality of life for the urban dweller, today and in the future. It would mean ample availability of affordable and well-built housing, good governance on all levels, well accessible employment on all level and access to public services for all citizens. Next to this it is vital to think of the spatial experience of the city and its public space and how to deal with nature and preservation of (cultural) heritage.

"Post-Independence city planning in India has tended to be a 'top-down' process positing a vision of the 'Modern' Garden City with its implied standards and norms. It has not addressed the dynamics of migration, especially of poor citizens, and the need to accommodate processes of economic and social transformation. (…) Urban development has tended to create urban geographies that perpetuate income disparities and social class distinctions. The present trends of a rapidly growing economy and high rates of urbanisation would exacerbate these conditions if city planning continues business as usual. With a growing understanding of environmental issues on the one hand and the political pressures for 'inclusive development' on the other a process of rethinking is under way. DELHI 2050 is an opportunity to reframe and articulate strategic objectives and concerns for city planning to work towards a healthy, sustainable future for the city."

Prof. Ashok Lall
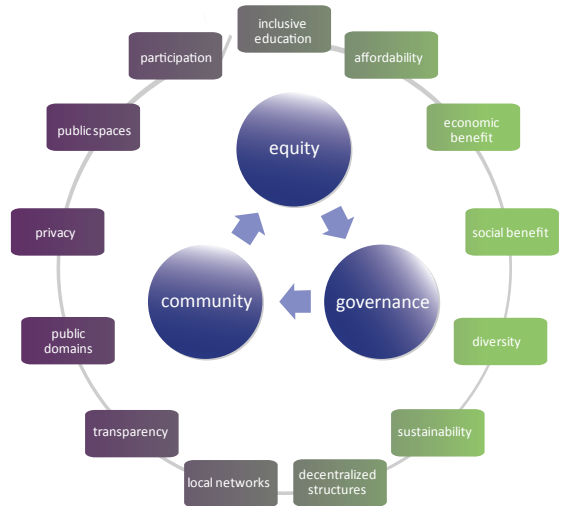
Thus city planning can be described as a process for designing the (physical) infrastructure and spatial frameworks for the development of the built environment to meet the aspirations and needs of the present and future citizens of the city. Within this framework there should be (literal) space for informal urbanism, albeit to minimal standards in terms of housing quality, connection to clean water and sewerage, power and communication networks.

To do so it is important to integrate top down and bottom up methods of governance and planning; These should be complementary instead of supplementary. The different physical scales of this integration are: The regional scale, defined by the interconnectivity of regional destinations of the mobility infrastructure and the geography of the region; the zonal scale, defined by local topography, rain catchment and drainage, agriculture and existing settlements linked to the mobility infrastructure; the local scale, defined by the site of urban precincts with a cohesive structure habitation an imaginable identity.

All stakeholders in spatial planning, on all levels should be recognised and an inventory should be made on their potentials in terms of function, spatial requirements, social values and contribution to local economic developments. With this inventory it is possible to involve them and to get support from them in development and regeneration programmes.

planet

A holistic approach can tackle the current supply gap, clean the Yamuna, balance ground water levels and create attractive public space.

'Necessary additional raw water is planned to be met from reservoirs and dams over 200km upstream. These projects are capital intensive, financially constrained and environmentally controversial and may not even come up to fruition. We worked out a holistic form of water augmentation so that an optimal combination of river waters, harvested rainwater and flood waters as well as ground water could be made use of. Our finding is that water harvesting and recycling within Delhi would result in meeting the current- and projected gap between demand and supply within five to ten years at affordable costs.'

Dr. Suresh Kumar Rohilla, Center for Science and Environment
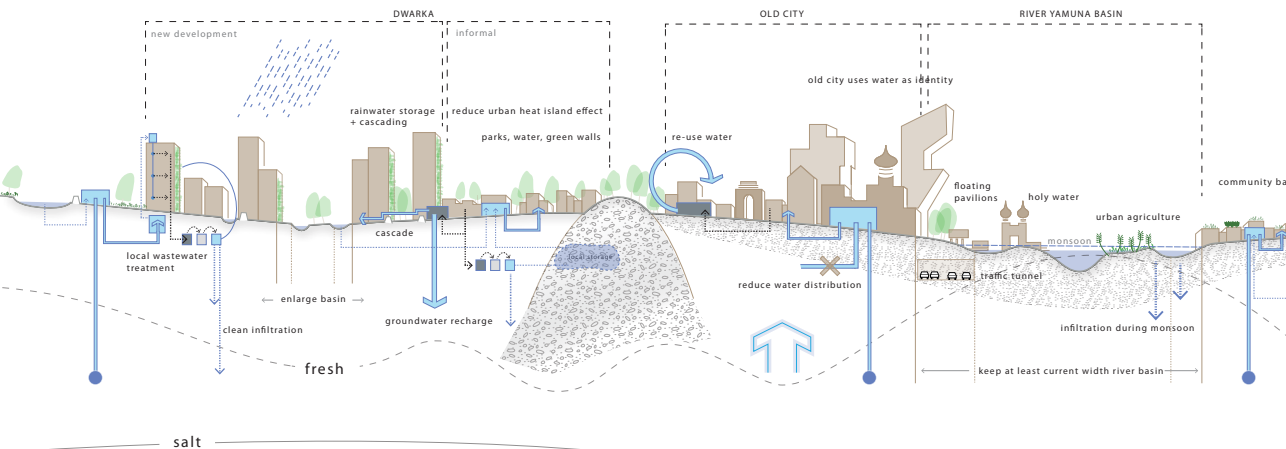
the proposed profile for water, where both centralised and de-centralised interventions support a balanced and closed water system, which purifies, infiltrates, harvests, cools and simultaneously improves public green and the identity of the city

22

What steps should be taken to transform the city and its surroundings into a balanced and coherent ecological system that can sustain in the long term. This ecological system implies an interaction between citizens and natural resources. What are the elements of this ecosystem and what do they contribute to the city and environment. Most of today's issues related to the environment in Delhi have to do with water but also public space. We proposed solutions for the currently failing ecosystem which will benefit both public space and the water system.
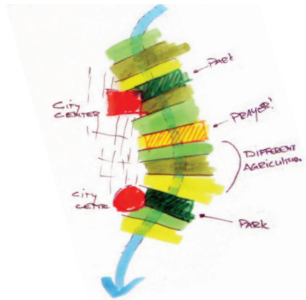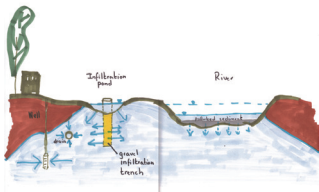
For instance the river Yamuna, which is heavily polluted and often floods in monsoon periods. Is it possible to clean this river again and make the riverbanks also suitable for sustainable urban development and in this way make the river a part of Delhi's identity (again). It is then also important to design the river banks and floodplains in such a way that high water levels do not pose a threat to the city anymore, but the fluctuating water constantly shifts the appearance of this new public waterfront and makes it attractive.

Another important issue in Delhi is the availability and quality of fresh water. The current centralised treatment and distribution of the water is depending on influx from the Himalaya glaciers, transported to Delhi through open canals. Not only is the quality of this water when reaching Delhi doubtful at best, it is also not enough. The piping in Delhi itself is also in bad condition, causing leakage and further contamination. New developments have to rely on trucks delivering water. Due to the poor availability of fresh water, a lot of people and businesses extract water from the ground by illegal pumping installations. This doesn't only decline the groundwater level by one meter a year, but also accounts for thirty per cent of household energy use.

The challenge is to combine the current centralised with a decentralised system for rain water retention, ground water infiltration and waste water treatment and reuse. This decentralised system can be installed whenever an neighbourhood or urban area is up for redevelopment. If you create urban green for the use of water retention, infiltration and water treatment, these areas will be more lush and create more shadow, more evaporation and thus more cooling of the city, decreasing the need for air-conditioning.

strategy to programme the floodplains of the river Yamuna and open the city again towards the river

strategy for cleaning river Yamuna, infiltrating the monsoon water and using this for drinking water

section of the strategy to extract drinking water from Yamuna floodplains

green blue network

sed rainwater harvesting

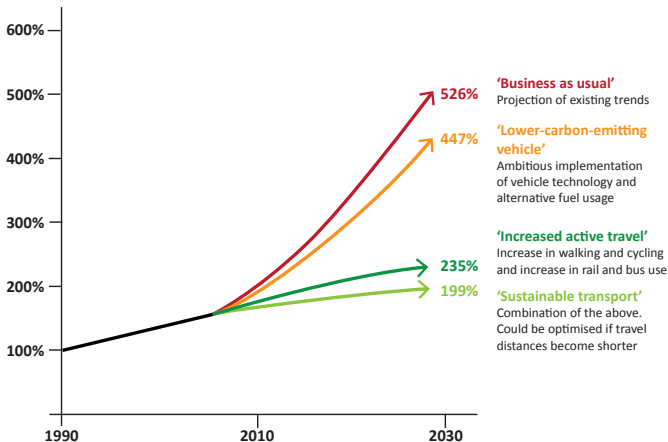local wastewater treatment

clean infiltration
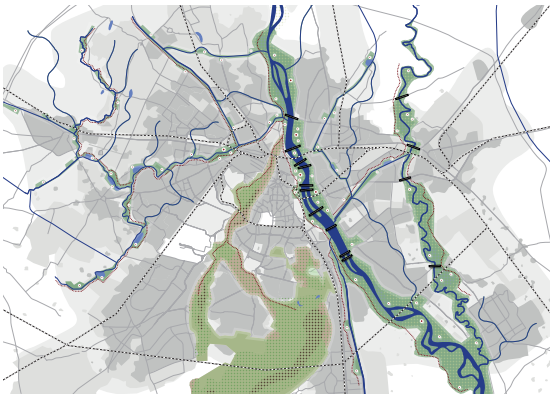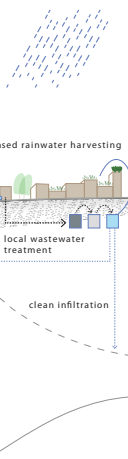
profit

Mass transit and densification can decongest the city again

"The current transport planning is completely based on on-going trends and inherently assumes that people's mobility behaviour will not change. Next to this, is doesn't include the optimisation of linking land use and transport networks. We need to work towards vision-based planning which will aspire the people of Delhi to change their ways of travelling. Therefore we should not only engineer, but also educate and enforce about mobility. And by combining the planning of mobility and urban tissue, we can make the city much more efficient. "

Mr. Alok Jain, MVA Asia

'Business as usual' — 526%
Projection of existing trends

'Lower-carbon-emitting vehicle' — 447%
Ambitious implementation of vehicle technology and alternative fuel usage

'Increased active travel' — 235%
Increase in walking and cycling and increase in rail and bus use

'Sustainable transport' — 199%
Combination of the above. Could be optimised if travel distances become shorter

The graphic shows the necessity for Delhi to commit itself to a new traffic strategy to keep it's increase in transport CO_2 emissions within 200% (from 1990). With current rise in population and car ownership, an increase in CO_2 emissions is inevitable.

From Geetam Tiwari, 2012

Economic prosperity is closely related to accessibility. The aim is to avoid that any future development of Delhi will be car dominated, leading to urban sprawl, too much congestion and insufficient accessibility for prosperous economic development.

Therefore it is suggested that the urbanisation process of Delhi will be mainly guided by systems of mass transit, instead of by the car alone.

New metro lines within outer ring road to safeguard it's accessibility, because existing and planned capacity is not enough. By adding new (radial AND tangential) lines the density of stations will increase. Change the circle freight line into metro. Last but not least, impose a 'commuter tax' on employers who benefit from metro to co-finance system.

To connect Delhi to outlying urban centers (which are too far out for Metro) develop Regional Express Rail, which travels faster and has fewer stops than metro.It is also very important to organise the feeder systems within the network;

Bus Rapid Transit systems are a flexible and relatively low cost addition to the rail bound mass transit modes. To make their use desirable they should be just as comfortable and safe. It can also be used as a feeder system for metro and RER;

Slow travel modes: Walking and cycling are vital, not only as a cheap and healthy way of travelling, but also as a feeder for mass-transit. Therefore it's essential to invest in safe and convenient routes for cyclists and pedestrians to and from stations. The image of walking and cycling needs to be changed, now being seen as poor man's choice it has to become fashionable to take the bike instead of car. None of these systems can work on their own. Logical interchange stations that facilitate a fast and comfortable switch between modalities create a citywide, robust and flexible mobility network. These multimodal hubs become the focal point for economic development.
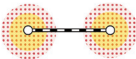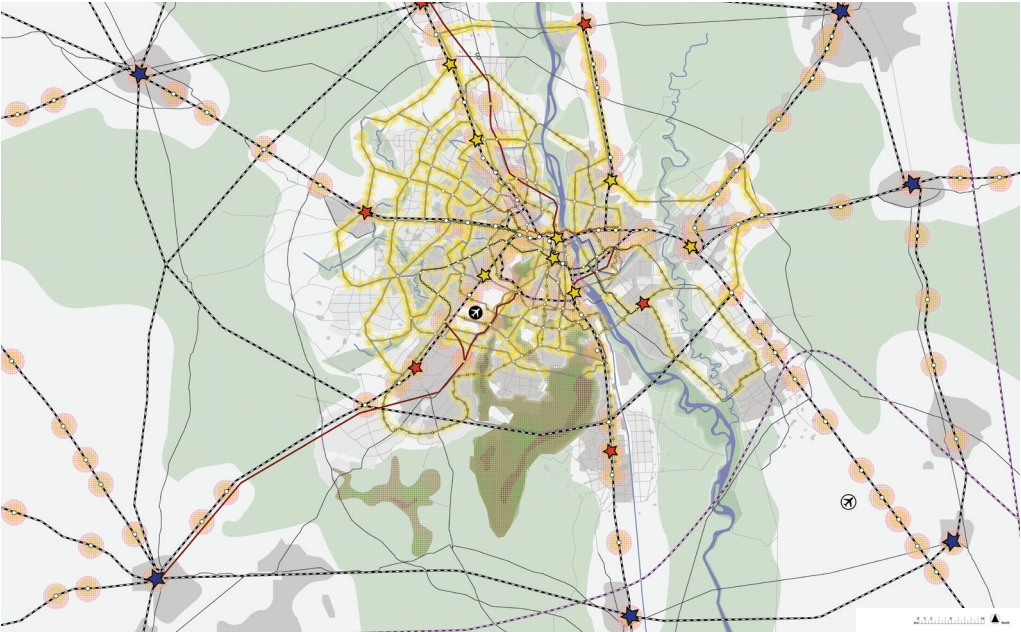
Train/RER = 2000m stopping distance
Area of influance = 2.000m
(Highly densed, walkable areas)

Mass Transit = 500m stopping distance
Area of influance = 1.000 m
(Highly densed, walkable areas)

Built-up area 2011

Minimal built-up area in 2040

Preserved Open spaces

(Existing and) proposed nodes

proposed urban netwerk for Delhi 2050: important is to conclude that Delhi should be a poly-centric city, in stead of a mono-centric one. Every urban node has its own specific programme and identity.

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test sites

test site:
kashmere gate as multi-modal hub

In the walled city fragment of Kashmere Gate, surrounded by major transport infrastructure, a great amount of small scale business takes place on tiny plots in narrow streets. Situated next to Old Delhi railway station it functions as one of the biggest wholesale markets of the city.

Though the splendour of this place can still be felt in rich courtyard houses with quiet interiors, overtime the mono-functional use affected the quality of the buildings; the area calls for regeneration. The major transportation hubs existing in the area are too far apart to actually work together, feeder traffic is unorganized, slow traffic network unplanned. The area could become one of the future economic anchors and a new center for the multi-centred metropolis of Delhi.

relocation of Old Delhi railway station
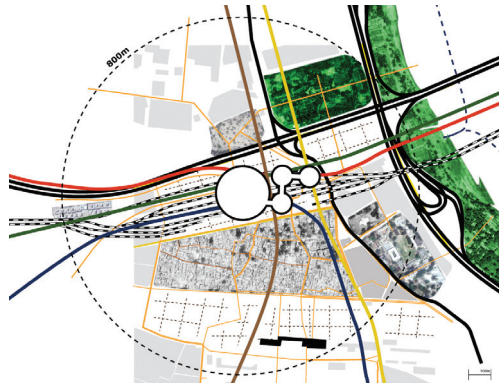
creating a new multi-modal hub, connected to the surrounding neighbourhood

From the analysis, both from literature and on-site, some strategies were developed. The thoughts behind these strategies were to divert heavy freight traffic away from this are which has not the morphology to deal with this traffic. By relocating Old Delhi train station you can develop one multi-modal hub for the exchange of people from train to metro to bus to taxi to bike etc. This would create space for redevelopment of this site for a truly pedestrian area with a pedestrian programme, well connected and walkable from the new multimodal station. The revenue from this development could be used for cleaning the river and creating an attractive urban waterfront on the Yamuna.

'Kashmere Gate (...) defies the break-up of Delhi into the 'Old' and the 'New'. Though at first glance it seems just a chaotic car parts bazaar and a monumentally busy thoroughfare, this has been and is a very significant gateway between the Delhi's of varying vintages.'

(from http://www.indianexpress.com/news/kashmere-gate/891958/, Seema Chishti : Mon Dec 26 2011, 03:52 hrs)

impression of a possible future for
Kashmere Gate
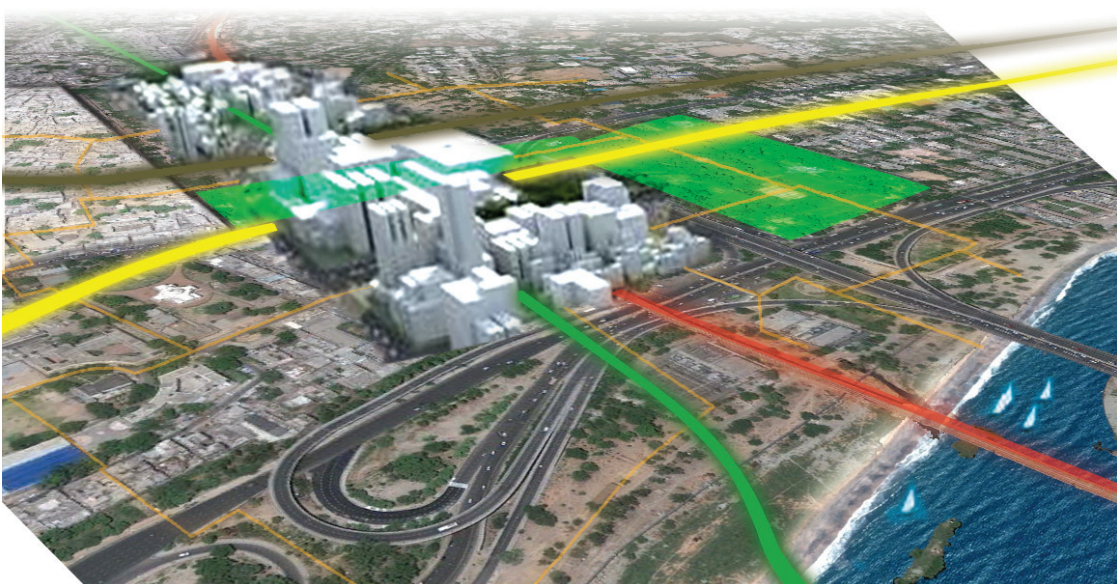
test site:
strategies for a sustainable Dwarka

Dwarka is planned as a residential suburb, a car-based dormitory town with mono-functional blocks, no real mix of typologies and a lack of a functional multimodal mobility network. Though Dwarka has over one million inhabitants, there is only one metro line connecting the area to the centre of Delhi and no direct connection to the neighbouring airport or the business district of Gurgaon.

The southern part of Dwarka is set-up as a planned development, based on a one kilometre grid, filled with gated communities, while the northern part is a recently authorised informal neighbourhood with a small grained structure. This difference in scale between the two Dwarka's is also causing most of the challenges this area is facing.

The informal northern part of Dwarka struggles with the lack of resources and space, while in the formal development existing public space is meant for cars only; oversized and therefore devoid of public life. By activating and programming the slow traffic routes towards stations and public amenities and therefore creating 'eyes on the street' it is possible to make the public space, especially at night, safer for pedestrians.

Many prefer the atmosphere, intimacy and convenience of the informal are, still they relocate to a gated community in the southern part for the benefit of parking space and organised, exclusive amenities like playgrounds, kindergartens and schools for their children, but keep returning to the old Dwarka for shopping. The other way around, people from the old part of Dwarka make informal use of the large patches of open space in the new part, since the lack of open space in the former. By formalising this exchange between the two parts, it's possible to improve the quality and use of the public space and could turn the area between the two areas into a vivid place of exchange.

concentrate and programme pedestrian routes and create eyes on the street, especialaly at night

Although the metro runs through Dwarka, the potential of this mass transit is far from fully exploited. Not only is there a lack of programme and facilities on the stations itself, it's also inconvenient and unsafe to get to the stations because the sur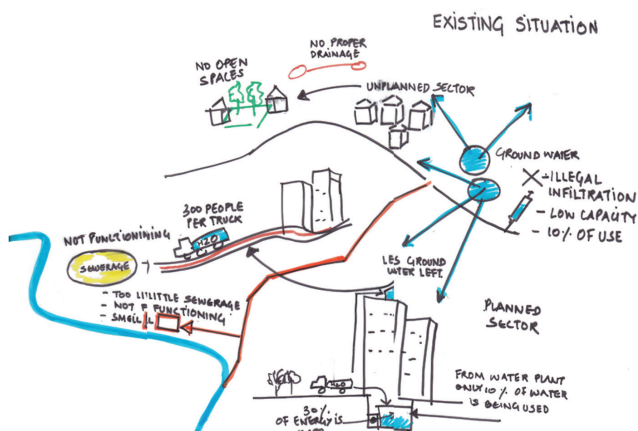rounding plots are vacant and desolate. By using these vacant plots for the development of public programme like hotels, shopping centres, sports facilities and cinemas these areas become vivid and public places. Besides programming the station areas, it's also vital to organise the feeder traffic from the neighbourhood to the station, whether it's bus, bicycle, pedestrian or (public) car.

Last but not least the current water system offers threats but also opportunities. Although in the new part all water infrastructure is in place, there is no flow from the centralised water plants, thus they rely on water delivery by trucks. The flow of sewage from the new part is too low for effective treatment in the treatment plant, while the old part is not connected to sewerage at all. By using the local topography it is possible to create a natural treatment system by using public green for treatment and infiltration. This will also create lush and attractive public space which can also be used for recreation, comfortable slow traffic routes and maybe even food production.

create new attractors and routes to integrate formal and informal Dwarka

current water deficiencies in Dwarka

make use of local topography for waste water treatment and reuse

31

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Ministry of Infrastructure
and the Environment

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| Bart Vink | Ton Venhoeven | Anne Feenstra | Romi Khosla | Ashok Lall |

steering group

persons with lots of knowledge, status & authority to get invited, give input and critique, represent a project

Advisory board

Advisory board

persons with lots of knowledge, status & authority to get invited, give input and critique, represent a project

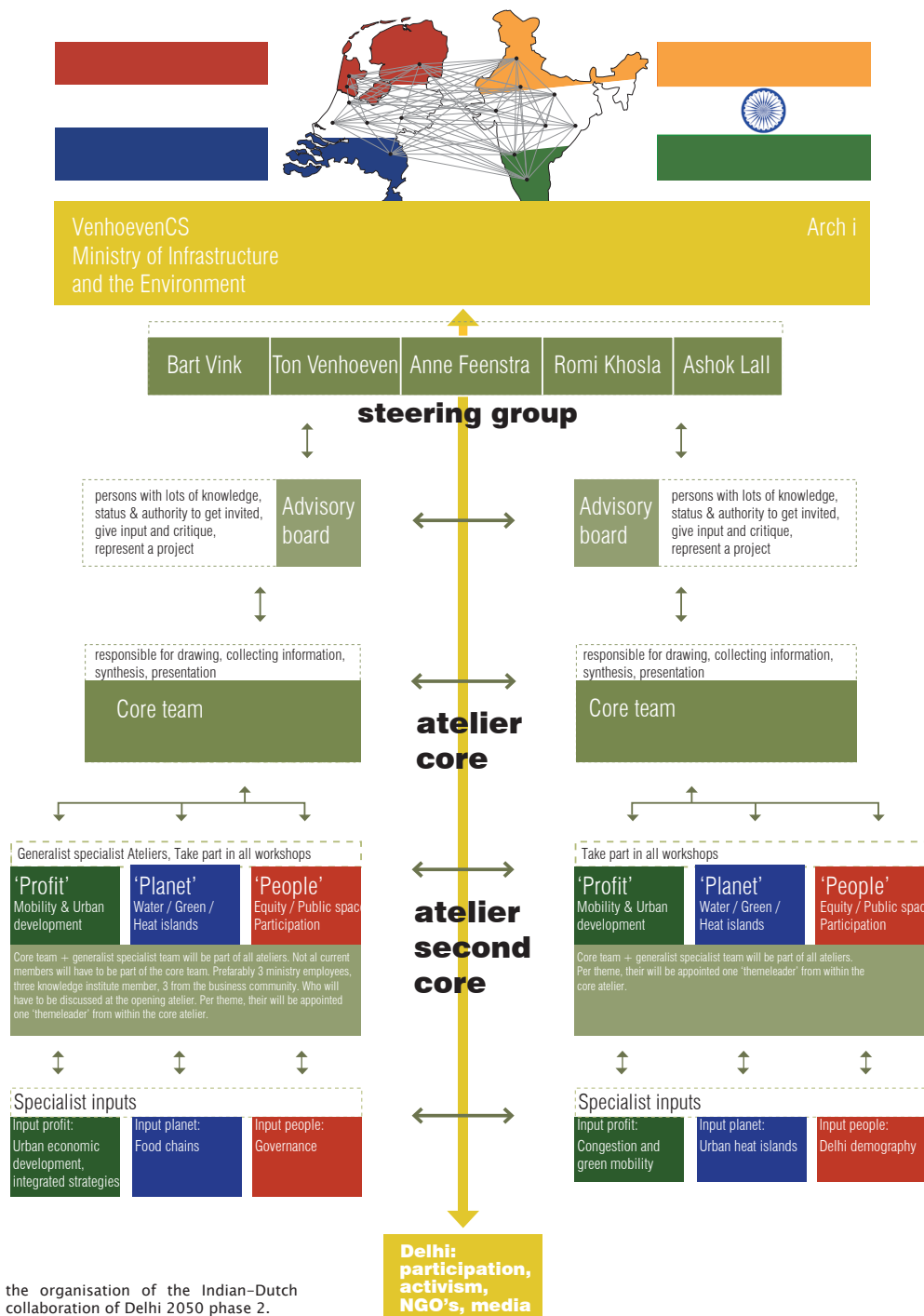responsible for drawing, collecting information, synthesis, presentation

Core team

atelier core

Core team

responsible for drawing, collecting information, synthesis, presentation

Generalist specialist Ateliers, Take part in all workshops

| 'Profit' Mobility & Urban development | 'Planet' Water / Green / Heat islands | 'People' Equity / Public space Participation |

Core team + generalist specialist team will be part of all ateliers. Not al current members will have to be part of the core team. Preferably 3 ministry employees, three knowledge institute member, 3 from the business community. Who will have to be discussed at the opening atelier. Per theme, their will be appointed one 'themeleader' from within the core atelier.

atelier second core

Take part in all workshops

| 'Profit' Mobility & Urban development | 'Planet' Water / Green / Heat islands | 'People' Equity / Public space Participation |

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Specialist inputs

| Input profit: Urban economic development, integrated strategies | Input planet: Food chains | Input people: Governance |

Specialist inputs

| Input profit: Congestion and green mobility | Input planet: Urban heat islands | Input people: Delhi demography |

Delhi: participation, activism, NGO's, media

the organisation of the Indian-Dutch collaboration of Delhi 2050 phase 2.

Delhi 2050 network

organisation

archforhumanity.blogspot.nl

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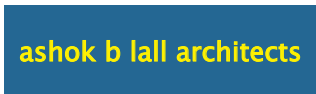**Ton Venhoeven**
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