

# What's Up, Germany?



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The Indo-German mag with swag!



## SMART CITIES

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# WHAT'S UP, AMBASSADOR?

**DR MARTIN NEY**

As engines of growth and innovation, cities play a vital role in socio-economic development. By 2050, it is expected that over 66 per cent of the world's population will be urban. This brings its own challenges: excessive pressure on already scarce resources, congestion, lack of housing, insufficient water and electricity supply, pollution and inadequate waste removal services. Cognisant of this dire outlook, urban planners, scientists and enterprises have been working on solutions and have coined a term for the desired overall outcome: smart city.

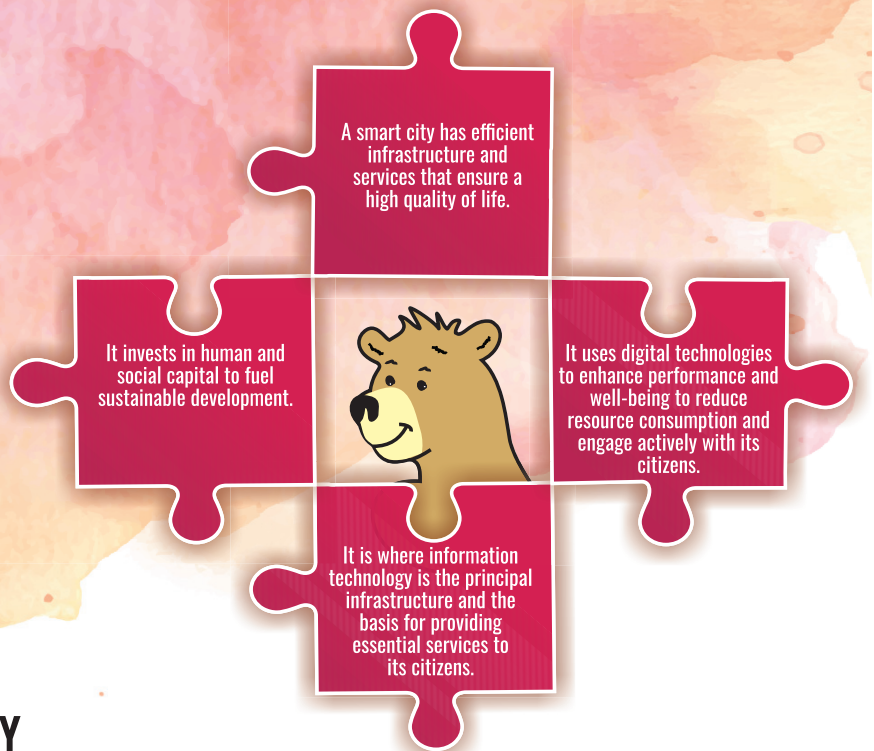
All around the world, city planners are committed to realising this aspiration. Germany has gained outstanding expertise in upgrading East German cities since our Unification in 1990, making it an ideal partner for India's "Smart Cities Mission". Furthermore, Germany is India's second-largest bilateral donor with a record commitment of ₹11,000 crore in 2015. Our development cooperation is focussed on improving living conditions in urban areas, with an emphasis on the urban poor. We are strong at smart urban planning. German companies have developed technologies that make cities more liveable.

Germany is committed to helping India make a success of its smart cities programme, particularly in Kochi, Bhubaneswar and Coimbatore, to which the German government has pledged special support in March. I visited the three cities recently to talk to stakeholders and further intensify our close cooperation. We have had a promising start. Germany has already been engaged in various sectors related to smart cities: sustainable urban mobility, water and wastewater management, renewable energies and energy efficiency. German companies are keen to partner with the cities to provide their cutting-edge technologies. Germany has also been supporting the Indian government's key initiatives, such as "Swachh Bharat", "Clean Ganga" and "Atal Mission for Urban Rejuvenation and Transformation".

With our enhanced collaboration on smart cities, we are adding another layer to our multi-faceted partnership. Enjoy exploring What's Up Germany?'s "Smart Cities" issue.

# WELCOME TO THE URBAN AGE

Cities are agents of change. Since their inception, they have been birthing revolutions, developing knowledge and fostering innovation. They are also places of hope: for over 5,000 years, people have been streaming into cities in the hope of finding freedom and a better life. More than half of the world's population already lives in cities, and this segment is expected to rise to two-thirds by 2050. This rapid urbanisation will put a strain on our limited resources; hence, it necessitates a change in the way we live and interact. It calls for smart city solutions that are in tandem with sustainable development and environmental protection. However, these solutions cannot just be a cut-and-paste job: each city is unique and has its own requirements. As there is no single template of a smart city nor a one-size-fits-all explanation, *What's Up, Germany?* collated the most relevant definitions.



## COMPONENTS OF A SMART CITY

### SMART GOVERNANCE



**More direct involvement:** using technology to facilitate greater transparency and faster decision-making between citizens, the government and public administration  
**Aim:** improve democratic processes, provide open data access and efficient public service delivery mechanisms

### SMART BUILDINGS



**Energy efficiency:** interconnected structures with a network of integrated service platforms that enable monitoring of energy usage, building management and video surveillance in a cost-effective and sustainable manner  
**Aim:** significant energy savings through improved technology

### SMART ENERGY



**Optimal usage:** employing technology to forecast energy demand, thereby enabling smart buildings to interact directly with energy providers  
**Aim:** allow smart grids to optimise electricity transmission and use renewable energy sources

### SMART MOBILITY



**Efficient movement:** reduction of traffic congestion and adopting faster and greener public and private transportation options  
**Aim:** ensure a functional transportation network and enable commuters to save time by installing intelligent traffic light systems

### SMART INFRASTRUCTURE



**Urban intelligence:** a smart system that monitors, communicates, analyses and adapts to changes in the environment  
**Aim:** respond to users' needs in real time

### SMART TECHNOLOGY



**Demand-supply management:** improving performance of electric grids, transportation networks, water supply systems and healthcare services  
**Aim:** align constrained supply with erratic demand more systematically to save resources

### SMART HEALTHCARE



**Saving lives:** interconnected health systems that use Information and Communication Technologies (ICT) to improve healthcare and emergency services  
**Aim:** ensure proper assistance in a timely manner

### SMART CITIZEN



**Proactive residents:** active participation of citizens in transforming their city into an inclusive, sustainable hub based on their individual needs  
**Aim:** empower and motivate citizens to take part in decision-making

**LEADING THE WAY** These metropolises share a common characteristic: they are all leaders in smart city development. *What's Up, Germany?* compiled a list of smart cities, highlighting each city's unique selling points. Let's travel the world smartly!

- Berlin:** eco-friendly mobility, development of vehicle-to-grid (V2G) technology
- Singapore:** smart traffic management, innovative water management system
- Paris:** shared mobility such as bike- and electric vehicle-sharing, digital governance
- Toronto:** smart commute, low-carbon initiatives, data analytics
- Barcelona:** smart grids, smart traffic management, low-carbon solutions
- London:** open data, congestion tax, sustainable innovations
- Tokyo:** smart mobility solutions, a zero-carbon suburban eco-village

- Seoul:** integrated public transport system, electronic currency
- Hong Kong:** smart cards for services, Radio Frequency Identification (RFID) technology at the airport
- Stockholm:** carbon-neutral efforts, smart transportation, ICT infrastructure
- Vienna:** intelligent technologies, digital governance, Smart Energy Vision 2050
- New York:** smart street lighting, bike-sharing programme, smart traffic management
- Copenhagen:** sustainable innovations, bicycle superhighway, carbon-neutrality commitment

As architects, we see it as our responsibility to contribute to a better tomorrow. Consequently, for us, smart solutions are always sustainable. For each project, we take global solutions and adapt them to local conditions like the climate or increasing energy costs. Mechanical shading, for example, avoids the harmful effects air-conditioning has on our environment and at the same time, saves energy.

— Angela Kreutz, CEO, Blocher Blocher India

SMARTIZEN



# DID YOU KNOW?

## TICK-TOCK

Almost 1,80,000 people are added to the urban population each day!  
(IBM)

## MARKET TREND

The global smart cities market will hit ₹93.7 lakh crore in 2020—nearly triple the global market size of ₹3,800 crore in 2013.  
(Grand View Research)

## COMMUTING PAIN

Across the world, 69% of commuters indicated that traffic has negatively affected their health. Around 42% reported increased stress and 35% experienced increased anger.  
(IBM Commuter Pain Index)

## A GLOOMY OUTLOOK

Cities already account for up to 70% of global greenhouse gas emissions. Almost 90% of the world's urban residents breathe air that contains more pollutant emissions than the recommended thresholds.  
(Siemens)

## MOVING TO URBANISTAN

In 2014, 54% of the world's population lived in urban areas. This proportion is expected to increase to 66% by 2050.  
(United Nations' World Urbanisation Prospects, 2014 Revision)

## CAR OVERDOSE

In 2014, there were about 1.2 billion vehicles on the road. This figure is expected to almost double by 2035.  
(Navigant Research)

## IN GREAT DEMAND

Metropolises consume about 75% of the world's natural resources and 80% of the global energy supply.  
(United Nations Environment Programme)

## PARKING WOES

Globally, drivers spend 70 million hours each year just looking for parking.  
(Streetline)

## SLUMS FOR RENT

Despite major advances in development, the world's slum population will likely double to two billion by 2030.  
(UN-HABITAT)

## MEGACITY DEVELOPMENT

There are 28 megacities with a population of over ten million in the world today. Sixteen are located in Asia, four in Latin America, three each in Africa and Europe, and two in North America. By 2030, the world is projected to have 41 megacities that will house 730 million people.  
(United Nations' World Urbanisation Prospects, 2014 Revision)

## SMART TECHNOLOGY

By 2023, global income from smart technologies will have tripled from the 2013 level—from ₹0.6 lakh crore to ₹1.84 lakh crore. The biggest technology market is expected to be the Asia-Pacific region.  
(Navigant Research)

## SMARTIZEN



Smart cities need smart societies and, of course, smart governance. This means nothing less than coping with tech challenges as well as societal and economic shifts. The government and administration are like an operating system—the "State OS". It has to be as innovative, secure and common as possible, and it must provide "digital public value" like information infrastructure, including hardware, software and data. A smart government initiates and cultivates co-creative innovations with civic society.

— Oliver Rack, founder, IOX Institute, Heidelberg, Germany



# SMART CITIES IN INDIA

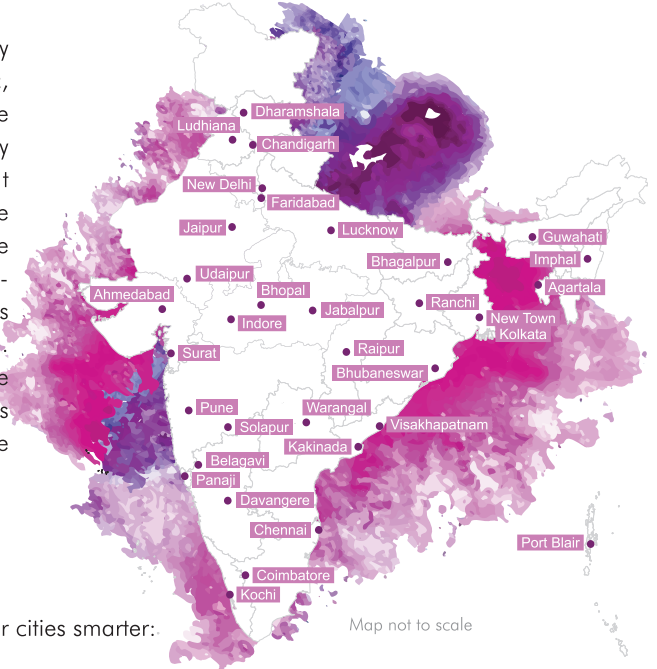
Urban planning is not a new concept in India: the Indus Valley civilisation—one of the earliest in the world—was way ahead of its times in terms of architectural prowess and urban development. Present-day India has developed rapidly, but concurrently there has been a substantial rise in population. Given India's current rate of urbanisation, an estimated 600 million residents are expected to be living in cities by 2030. The worsening urban sprawl creates major challenges: increased poverty, health hazards, environmental degradation and scarce resources. This calls for immediate action in the form of smart city solutions. Recognising that comprehensive development is the need of the hour, the Indian government introduced the "Smart Cities Mission". It aims to provide core infrastructure, smart city solutions, a good quality of life and a clean and sustainable environment.

## INDIA: THINKING AHEAD HOW THE SMART CITIES MISSION WORKS

The Indian government plans to upgrade 109 cities to smart cities. Currently, 33 cities have been selected for priority funding based on their proposals. The central government will provide each of the 109 cities ₹500 crore over the next five years towards this ambitious programme. The state governments will have to contribute the same amount. The selected cities have identified specific areas for an integrated urban renewal approach and city-wide smart solutions which will serve as examples for cities all

over India. Various issues like energy efficiency, housing, mobility, etc, would be covered. Special Purpose Vehicles (SPVs) created in each city will implement the development projects and raise funds. The execution of these projects will be done through joint ventures, subsidiaries, public-private partnerships (PPPs) and turnkey contracts. Countries with extensive experience in city development, such as Germany, are contributing to the "Smart Cities Mission".

## 33 CITIES SELECTED FOR THE SMART CITIES MISSION



## NO NEED TO START FROM SCRATCH!

*What's Up, Germany?* presents three initiatives that are already making our cities smarter:

### SWACCH BHARAT-CLEAN INDIA



Is your street full of garbage and needs cleaning? This app allows you to click pictures to report, geotag and timestamp areas in your city that need urgent revamping. It has already been downloaded over 12,000 times and has 5,000 active users.



### I PAID A BRIBE (website and app)

This initiative is tackling institutional corruption through crowdsourcing. And with success! Over the last six years, users have filed more than 86,720 reports across 1,071 cities in India.



### NEXTDROP

In the twin cities of Dharwad-Hubli in the state of Karnataka, water supply was unpredictable until NextDrop stepped in. This Bengaluru-based startup collects and shares water delivery information with residents and water utility companies. NextDrop's SMS service has over 25,000 subscribers, paying a monthly fee of ₹10 to receive water alerts. With plans to expand to other cities, this social enterprise is hoping to make big waves!

## THE INDIAN GOVERNMENT'S SMART CITY DEFINITION

A smart city "means different things to different people... In the imagination of any city dweller in India, the picture of a smart city contains a wish list of infrastructure and services that describes his or her level of aspiration. To provide for the aspirations and needs of the citizens, urban planners ideally aim at developing the entire urban ecosystem, which is represented by the four pillars of comprehensive development: institutional, physical, social and economic infrastructure... The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a lighthouse to other aspiring cities."

Smart city is not a concept; it is a cumulative action plan to create better and sustainable livelihood for the deserving citizens of India. A participative approach makes things happen. By following this mantra, we can make the smart city programme a success and implement it in any Indian city. People interacting with government bodies will help to set the right priorities while identifying projects. It will create the willingness to accept the changes and absorb the costs required to achieve a high standard of living. This, in turn, will make the proposed development model financially viable.

— Nishant Vasani, vice president, Magus Consulting, Mumbai

SMARTIZEN





# GERMANY: EVOLVING WITH FORESIGHT

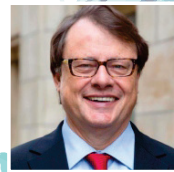
As a champion of sustainable development, Germany has long recognised the importance of cities as road maps to the future. It is actively positioning itself as a leading provider of smart city solutions for the world. In addition, its energy transition (Energiewende) is further spearheading the global shift towards smart cities. In 2012, the German government adopted the CO2-neutral, energy-efficient and liveable city of the future as the central theme of its High-Tech Strategy 2020 Action Plan. This plan identified ten future projects as the focus of research and innovation. It comes as no surprise that the German smart city definition has a

strong focus on clean energy: it is a city that uses modern technologies to combat climate change and pollution as well as enhance the quality of life in a sustainable way.

Germany is playing it right by involving all stakeholders in the process of coming up with smart city solutions, from the central government to local authorities, private businesses to research institutes. Chancellor Angela Merkel's commitment towards a sustainable future on a domestic and international level has paved the way for many public-private partnerships. In addition, the country's rich research landscape and empowered citizens provide further impetus towards the goal of innovative smart city solutions and better living.

## THE 10 SMARTEST CITIES IN EUROPE

Source: Fast Company



Smart urbanisation is no accident. The urban future requires planning, foresight and co-ordination. To put it simply, it requires governance... It's vital that we deepen our understanding of urbanisation and share crucial knowledge about how urbanisation can bring prosperity and wellbeing... If smart urbanisation is our goal, technology is a crucial enabler. We already understand why urbanisation has driven prosperity. Scale economies play a role... In addition, sharing of knowledge is much easier. Centres of innovation, expertise and creativity develop much faster where people come together. That's been true for centuries—from the Silk Road cities to Silicon Valley. Now, in the digital age, we have a unique opportunity to take a quantum leap forward by using technology to improve the lives of citizens in the future.

— Thomas Matussek, managing director, Alfred Herrhausen Society

Recognising that the only way to respond to the challenges of urbanisation is to acknowledge that a city is made up of a complex system of interconnected networks that include smart power grids, integrated mobility, green buildings, etc, Germany has initiated forward-looking initiatives and pilot projects:

### TELEKOM-CITY FRIEDRICHSHAFEN



The residents of Friedrichshafen—a city in south Germany—were part of one of the most comprehensive smart city projects in the country. This public-private partnership project, started in 2007, was planned and executed with Deutsche Telekom. Its aim was to test smart city services, such as e-governance apps, e-ticketing, networked homes, from conception to deployment. The result: more than 40 projects developed with the community were implemented. The T-City project demonstrated how modern information and communication technology can enhance quality of life.

### MORGENSTADT: CITY OF THE FUTURE



Less talking, more doing is the credo followed by the team behind Morgenstadt. An initiative of the Fraunhofer Society—the world's largest organisation for applied research—Morgenstadt is one of the ten projects selected to be part of the High-Tech Strategy 2020 Action Plan. It is a vision of a sustainable, liveable and innovative city. The Morgenstadt Network, consisting of 21 industrial partners, ten international cities and 11 Fraunhofer Institutes, aims to conceive, initiate and implement pilot projects for sustainable urban solutions in Germany and around the world.

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We all aim to improve the liveability of cities, but all actions have to address citizens first. In India, being smart would be to learn from the 1,000+ successful projects across the globe and to deconstruct, adopt and adapt them to the Indian context. One needs to think about impact first, then about technology. Engage with citizens, build communities around relevant topics, be transparent and trustworthy. India can—and should—improve dramatically over the next ten years. It's time to move!

— Olaf-Gerd Gemein, business architect & co-founder, Smart Cities Lab, Mumbai, Hamburg & London



# FULL SPEED AHEAD: GERMAN CITIES GET SMARTER

Experts all over the world are envisaging how our future cities will look, sound and feel like. Germany already has excellent infrastructure and is on the fast track to a smart(er) future. As 74 per cent of Germans live in cities and towns, the relevance of strategic urban development through digital solutions is widely recognised. Supported by the government, local authorities are launching their own smart city projects jointly with the private sector, utility companies and universities. A range of administrative, political and social services is being delivered through Information and Communications Technology (ICT) and Geographic Information System (GIS) platforms. These platforms are still evolving and being created. Here's an overview of Germany's pilot projects and smart city solutions.

"Cities are places where an intensive dialogue between science and citizens is possible. Impetus for sustainable living and business mainly comes from cities."

— Johanna Wanka, Federal Minister of Education and Research

## 1 BERLIN Pretty, and Pretty Smart!

Through the "BerlinStrategy | Urban Development Concept 2030", the city has delineated its cutting-edge master plan. Its objective is to expand the international competitiveness of the Berlin-Brandenburg metropolitan region, increase resource efficiency and climate neutrality by 2050, and to create a pilot market for innovative applications. The aim is to make Berlin an urban laboratory where services and products of the future are created. All stakeholders are working in tandem to make the city a best-practice example in the European smart city movement. The Smart City Berlin Network, consisting of more than 100 companies and numerous science and research institutes, is already running pilot projects. Digitalisation pervades all areas of urban life, enabling a wide range of smart solutions, such as intelligent vehicles, smart grids, smart homes, etc. New technologies like mHealth (a telemedicine platform), 5G networks and Vehicle-to-Grid (V2G) are being tested.

## 2 FREIHEIM Energy Efficiency to the Fore

Under the EU-funded demo programme "Smart Together", Munich will implement smart solutions in the newly constructed district of Freiheit. Energy-saving innovations will take centre stage, from electric buses and intelligent street lamps to apps providing real-time public transport information.

## 3 HAMBURG The First Seatropolis in the Making

Hamburg and Cisco are taking urban planning to the next level. Building on the Internet of Everything (sharing of data between smart devices over a network), they aim to start pilot projects in the areas of smart traffic and street lighting, infrastructure sensing and virtual citizen services. One of the main focus areas is to develop the port into a smartPORT and to continue work on the HafenCity, Europe's largest inner-city development project.

## 4 MODEL CITY MANNHEIM (MoMa) Project

Mannheim, the birthplace of the automobile, has every reason to toot its own horn: under the MoMa project, every household has been connected to a smart grid system. Referred to as the "Internet of Energy", this system allows consumers to adapt their energy needs to current generation from the wind and sun. They can monitor their energy consumption through boxes called "energy butlers".

## 5 STUTTGART SERVICES PROJECT Move Smartly!

Under this ambitious project, the citizens can make payments, access transport and other services (library, swimming pool, etc) using a single smart card. Intended to become a showcase, the project aims to make access to e-mobility services seamless.

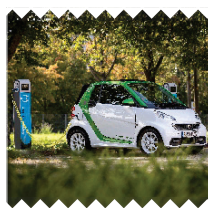
## SMART SOLUTIONS: SMARTER, GREENER, MORE SUSTAINABLE

### ON A ROLL WITH FAHRINFO PLUS



German company HaCon has developed HAFAS, a software that enables millions of people to stay up-to-date on public and private transportation. BVG, Berlin's main transport operator, introduced Fahrinfo Plus, a mobile app based on HAFAS that provides timetable information and route planning.

### CARE TO GO FOR A RIDE?



Headquartered in Stuttgart, car2go is one of the largest car-sharing services in the world. Customers can simply download the app, and get, set, go! They can use their smartphones to check where the nearest unoccupied Smart Fortwo electric vehicle is located and drive off!

Smart Cities should be sustainable urban and economic developments that foster liveability, prosperity and a healthy environment for citizens. In our opinion, more time should be spent on developing the strategic roadmaps to ensure that in the long run India's smart cities really address the needs of the people, the economy and the different regions. Inclusive planning caters for all parts of society, including the migrant population.

— Dr Mirjam Wiedemann, PhD, managing director, WiedemannConsultants GmbH

SMARTIZEN





# INDO-GERMAN COOPERATION

India and Germany are making waves yet again! At the third Intergovernmental Consultations, held in New Delhi in October 2015, Prime Minister Modi and Chancellor Merkel agreed to steer the strategic partnership into a new and exciting phase. They identified sustainable urban development as a key area of cooperation and recognised the new opportunities the Indian government's smart cities initiative presented. Germany has already committed up to ₹12,600 crore towards sustainable urban development so far.

Over the next years, in support of India's "Smart Cities Mission", Germany will assist projects in Kochi (Kerala), Bhubaneswar (Odisha) and Coimbatore (Tamil Nadu). Germany's leading companies will share their expertise and technology in areas like urban mobility, water and wastewater management, renewable energies and energy efficiency. Prominent research institutes like the Indo-German Science and Technology Centre (IGSTC) and Deutsches Wissenschafts- und Innovationshaus (DWIH) New Delhi are also actively working on smart cities. Smart cities fast forward!



The phrase smart cities has a myriad connotations. Commonly, it is used to convey a good quality of life for its citizens through

various interconnected and easy-to-access measures. At Fraunhofer, a lot of research has gone into what makes the "Zukunftstadt" or the "City of Tomorrow". We have analysed more than six cities—including New York, Singapore, Berlin, Copenhagen, Freiburg—and have created sustainability profiles. Thereafter, in partnership with our extensive consortium of industry, government and research, we implemented as many as eight Smart City Labs—in Berlin, Eindhoven, Prague, Lisbon, Manchester, Stavanger, Chemnitz and Tiflis. The best practices learnt from these Smart City Labs are now available for India to take advantage of. It would be exciting to implement technologies from Europe for the unique requirements of growing Indian cities. Our focus would be multi-stakeholder dialogue and interdisciplinary cooperation among the various user agencies. Technology and innovation are important inputs to smart city initiatives, and Fraunhofer would be delighted to provide technology solutions for mobility, energy, ICT and security that suit the Indian context.

— Anandi Iyer, head, Fraunhofer Gesellschaft, India

## ONGOING AND UPCOMING INDO-GERMAN PROJECTS



### Kochi (Kerala)

The expertise of the German rail operator, Deutsche Bahn International, is being utilised to handle the safety and monitor quality of the 26-kilometre elevated Kochi Metro. In addition, Kochi Metro Rail Ltd has a deal with the German development bank KfW to develop an integrated waterways project in the city. The project aims to provide better transportation facilities to people residing in nearby areas, develop rural roads and enable inclusive growth in the islands.

financing for environmentally relevant projects through loans and capital grants. Over the last seven years, on behalf of the German government, KfW has provided concessional loans amounting to ₹1,928 crore to TNUDF towards sustainable urban development projects, including in Coimbatore.



Credit picture alliance / PhotoStar

### Bhubaneswar (Odisha)

The Odisha Urban Infrastructure Development Fund (OUIDF) is an ongoing bilateral success story. Launched by the state government in 2012, OUIDF is supported by the German government through KfW, which facilitates the financing of sustainable urban infrastructure projects in the region. It has extended a concessional loan amounting to ₹371 crore and another ₹18.5 crore towards technical assistance. Currently, OUIDF is implementing five projects in Bhubaneswar.



### Coimbatore (Tamil Nadu)

The Tamil Nadu Urban Development Fund (TNUDF), a public-private partnership between the state government and three Indian commercial banks, aims to provide

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The "Smart Cities Mission" is going to be successful because of the innovative use of technologies to deliver services and leverage government funds. Urban leaders have to build trust among citizens and convince them about the project's benefits. This would help generate additional municipal revenues and improve services. We have a lot to learn from German cities when it comes to using innovative technologies and involving citizens as stakeholders.

— Prof Chetan Vaidya, director, School of Planning and Architecture (SPA), New Delhi





# MISSION TRANSFORM(N)ATION!



## Electronics City (Karnataka)

Bengaluru is one of the hottest startup hubs in the world. The IT hub Electronics City currently houses around 102 companies and is growing exponentially. The Electronic City Industrial Township Authority (Elcita)—which is responsible for managing the industrial township—has collaborated with Leibniz University of Hannover and the Germany-based waste treatment specialist, Wasteconsult International, on a ₹40-crore project.

The plan is to build a 100 tonne-per-day solid waste management plant using German technology that can process both segregated and unsegregated waste. The university has come out with a unique design to produce output like compost, recyclables and fuel for cement industries.



Germany wants to support the ambitious smart cities programme. Here, the Federal Building Ministry also supports

German companies that want to cooperate intensively with Indian partners in order to assist Indian cities in implementing their plan... But first we would like to enter into direct dialogue with the three cities Bhubaneswar, Kochi and Coimbatore to help them with the implementation of their smart city plans, among other things with feasibility studies.

— Gunther Adler, German State Secretary, Ministry of Environment, Nature Conservation, Building and Nuclear Safety (BMUB)



Image: Manoj Nair

## Bihar

The German water treatment expert Harbauer and its Indian subsidiary have launched a mobile water testing lab in rural Bihar. This unique water testing laboratory on wheels is equipped with state-of-the-art technology which can conduct tests and analyse water on the spot. Quite sturdy in nature, it can even reach remote areas of the state for spot analysis of the water quality.



## 100 SMART CITIES IN INDIA

India seems to be on everyone's minds, including at the smart cities conference held during the "Metropolitan Solutions 2016" summit in Berlin. Urban Development Minister M Venkaiah Naidu opened the conference and introduced the Indian government's smart cities initiative and the opportunities it presents for German firms. He recommended that service and technology providers organise themselves into consortia to take advantage of the investment opportunities. There is great interest—and equally great demand!

## SMARTIZEN



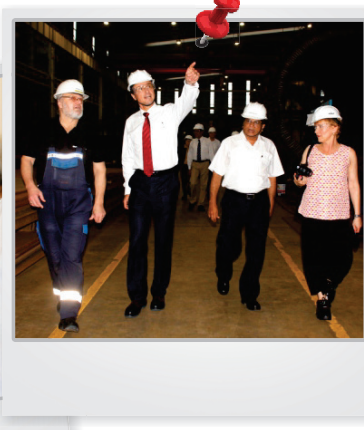
It takes smart people to build a smart city. Educate people and teach them about the needs, necessities and vulnerabilities of their city in a global context. Create a city-specific vision that they can embrace. Enable people to think and act in keeping with that vision by providing them with smart infrastructures. Use digitisation to leapfrog 20<sup>th</sup>-century appliances. Unlock people's creative and value-creation potential to promote productivity. That will offer them prospects and freedom of action, leading to enhanced vision creation, liveability, sustainability and resilience. This smart city formula will require determination, discipline and a super-efficient city government.

— Dr Chirine Etezadzadeh, president, SmartCity.institute, Germany, & founder of SmartCityNews.global

# DR NEY HITS THE BULLSEYE

German Ambassador to India Dr Martin Ney recently visited Bhubaneswar, Kochi and Coimbatore—the three cities the German government is supporting as a partner of India's "Smart Cities Mission". The trip was significant, as it contributed to building a roadmap to turn these metropolises into smart cities with technical collaboration and financial assistance from Germany. **What's Up, Germany?** travelled with the ambassador, his wife, Dr Gabriele Ney, and the accompanying high-level delegation to capture the most notable and memorable moments.

8<sup>th</sup> July 2016



## BHUBANESWAR'S SMART CITY PLANS

**Bhubaneswar Town Centre District (BTCD):** retrofit and redevelop the area around the main railway station into a vibrant destination. Fifty-six projects have been planned for the BTCD.

**Intelligent City Operations and Management Centre (ICOMC):** this state-of-the-art centre will provide a digital platform for integrating traffic management, emergency response, parking solutions, bus operations and common fare card. ICOMC, Bhubaneswar's pan-city solution, will be the backbone of all systems and services.

## Bhubaneswar (Odisha)

The city of temples has a deep connection with Germany. Designed by German architect Otto Königsberger in 1946, modern Bhubaneswar is one of the first planned cities in India. As one of the fastest-developing urban areas in the country, Bhubaneswar's original town planning needs to be looked at afresh. The city topped the list of 20 cities selected under the smart cities initiative and was the first to form a Special Purpose Vehicle (SPV), the Bhubaneswar Smart City Limited (BSCL), to facilitate its metamorphosis into a smart city.

During his visit, Dr Ney conferred with Chief Minister Naveen Patnaik, Odisha's Housing and Urban Development Minister Pushpendra Singh Deo, Governor SC Jamir and other senior government officials. Germany will focus on the areas of water and wastewater management, solid waste management, renewable energies and energy efficiency, complete street projects and sustainable urban mobility. Special attention will be given to non-motorised transport, including the introduction of e-rickshaws and bicycle-sharing projects. The visiting delegation included representatives from the German companies Bosch, Siemens, Dorsch Group, Harbauer and TÜV SÜD. The German Development Bank KfW is discussing several environmentally relevant urban projects for future cooperation with the Odisha government and Bhubaneswar city, which may lead to concessional loan support ranging from ₹1,400–2,200 crore.



## SOLAR ENERGY LEADER

**Cochin International Airport** is a stand-out when it comes to clean energy: it is the world's first airport running solely on solar power. CIAL (Cochin International Airport Ltd) has installed a 12MW solar plant with more than 46,000 panels on 45 acres at an investment of ₹62 crore. Its entire power requirement of about 50,000 units per day is met through solar energy. The project was executed by the Bosch Energy and Building Solutions' team in India (BEBS) in a short span of six months. Over the next 25 years, this project will avoid carbon dioxide emissions from coal-fired power plants by more than 3 lakh metric tons—equivalent to planting 3 million trees!

## Kochi (Kerala)

This port city has been drawing traders and explorers to its shores for more than 600 years. Interest in Kochi is about to reach new heights, as the city ranked fifth among the 20 cities selected in the first round of the "Smart Cities Mission". As part of the city's smart makeover, the local government announced the establishment of a Special Economic Zone (SEZ) that will be fully operational in 2021. The project is expected to generate over 90,000 jobs. The SPV formed with a budget of ₹2,000 crore has been named Cochin Smart City Mission Ltd.

Kochi, too, has enjoyed a long-term partnership with Germany. With German assistance, it will soon become India's first metropolis to have a fully connected ferry system that will complement the existing metro rail and bus transport. The "Integrated Water Transport" project will be the first to be funded by KfW under the "Climate Friendly Urban Mobility" framework of Indo-German cooperation. The agreement between KfW and Kochi Metro Rail Ltd (KMRL) was signed in the presence of Ambassador Dr Ney. During this tour, he met Minister KT Jaleel, Kochi Municipal Corporation's secretary Amit Meena, managing director of KMRL Elias George and Mayor Soumini Jain, among others.

A sum of ₹196 crore from Germany's ₹630-crore soft loan has been set aside to purchase 78 air-conditioned, Wi-Fi-enabled ferries for the Greater Kochi region. These ferries are 20 per cent more fuel-efficient than the boats currently being operated, leading to a reduction in emissions. The state government, on its part, will contribute ₹102 crore. The overall project implementation will be in two phases and will be completed by 2020. It includes the development of 16 identified routes, connecting 38 docks across ten islands and spans a total route network of 76km.

## SMARTIZEN



Sensible governance practices by civic institutions and citizens caring for their city make it smart. Civic institutions should correctly understand a city's social, economic and physical requirements and its diversity, and respond accordingly. At the same time, citizens should show a greater sense of civic responsibility. The most important element is the ability of civic institutions to offer a superior quality of life to all residents. This can be achieved by a judicious utilisation of resources, efficient delivery of urban services and protection of the environment.

— Rumi Aijaz, senior fellow, Observer Research Foundation (ORF), New Delhi

## Coimbatore (Tamil Nadu)

Coimbatore, the second-largest city in Tamil Nadu and the 15<sup>th</sup>-largest urban agglomeration in India, made it to number 13 on the list of 20 smart cities selected in the first round. The SPV, Coimbatore Smart City Ltd, will implement the initiatives. The local government plans to concentrate its efforts on wastewater treatment, urban mobility and renewable energies, with a special focus on the development of eight lakes. German companies are known for their expertise in these areas.

Ambassador Ney, along with a ten-member delegation, met the mayor, government and civic body officials to take the smart city project forward. A day prior, he had detailed discussions straddling various areas of cooperation with Chief Minister Jayalalithaa, during which she assured her cooperation. Dr Ney reiterated that Germany would use its expertise and experience at urban planning and development to help make Coimbatore a smart city.

Coimbatore has a long-standing relationship with Germany. Through KfW's credit line to the Tamil Nadu Urban Development Fund (TNUDF), Germany is supporting water supply improvement and water bodies' redevelopment projects in Coimbatore. Robert Bosch India Ltd (RBIL), a wholly-owned subsidiary of the engineering and electronics giant Bosch, has established one of its largest development centres outside Germany in Coimbatore. Additionally, Coimbatore and the German city of Esslingen signed a twin-city agreement recently.



20<sup>th</sup> July 2016



### COIMBATORE'S SMART CITY PLANS

**Seamless mobility:** retrofit the development of central Coimbatore, incorporating a 30km-long non-motorised transport corridor. Steps will also be taken to increase the use of public transport.

**Rejuvenation of city lakes:** develop an integrated network of the city's lakes and reinforce their flood management capacity. Creating open life spaces will also be a priority.

**Security and connectivity:** implement a modern CCTV surveillance and traffic monitoring system. Smart street poles with Wi-Fi routers, cameras and energy-saving LED lights will be set up.

**Home improvement:** rehabilitate low-income households and provide essential services embedded with smart solutions.

Germany has 50 years' experience in planning smart cities, and we are proud to be in partnership with Kochi, which is on its way to becoming a smart city, and we intend to start our journey towards that through sustainable and environment-friendly urban mobility.

— Ambassador Dr Ney

22<sup>nd</sup> July 2016



### KOCHI'S SMART CITY PLANS

**Seamless multi-modal transport:** improve mobility between Fort Kochi, Mattancherry and the Central Business District City through waterways, pedestrian-friendly roads, bicycle tracks and redesigned road networks. Metro transits, bus terminals and railway stations will be linked with the waterways. For last-mile connectivity, electric feeder buses and e-rickshaws will be deployed.

**Smart citizen tools:** integrated delivery of government-to-citizen services using SMART Cards and mobile platforms. The EMV-enabled SMART Card payment solution is to be extended to all city transport services.

**Intelligent water management solutions:** ensuring 24x7 water supply in the next four years by implementing solutions such as smart meters and command and control systems.

Walking has been and must remain the mother of all movements in all smart cities. It is environmentally friendly, socially interactive and it promotes health. We must use innovative design and technology to enable smart walking: landscaped areas that encourage walking, umbrellas that open to provide shade and collect water, lighting that senses pedestrians and adjusts to their needs and fine water sprays in hot climates that make walking a joy. Public travelators, like in Hong Kong, can make walking up a gradient possible for the old and disabled. Smart walking will increase citizen interaction and participation in cities. And the cost of facilitating it will be much lower than the cost of promoting vehicular mobility.

— Shyam Khandekar, co-founder & editorial director, *myliveablecity*, Netherlands & India

SMARTIZEN



# THE ARCHITECTURE OF SUSTAINABILITY

**morphogenesis.**

**What's Up, Germany?** spoke with Manit Rastogi, founding partner at Morphogenesis, one of India's leading architecture and design firms, on the need for a more holistic approach to urban design and city planning.

**At Morphogenesis, you place a great deal of emphasis on sustainable solutions. Tell us more about your approach and design sensibility.**

We understand that we are often working in an environment with limited resources. Our approach to creativity is inspired by the evolutionary processes in nature. Our belief in sustainability shapes all our projects and is a consistent theme in our designs. At Morphogenesis, we deploy passive strategies by responding to the local climate and ecology, and address parameters like comfort, safety and liveability. We are mindful that the projects we undertake remain economically viable and globally pertinent.

Given that our cities occupy a mere 2 per cent of the earth's land surface, yet they consume 75 per cent of the earth's resources, there is an intrinsic need to start exploring the possibilities of a closed-loop typology of architecture. Assuming there is no energy, no water and no waste disposal, how does one approach design? As a response to limited natural resources, especially water and energy, traditional architecture has always been green.

**What, according to you, should be the number one priority of the "Smart Cities Mission"?**

The most critical priority of the government's smart cities project should be to establish a model of governance where the functionalities of various departments are clearly defined, with minimal overlap, and processes and policies are streamlined. The city is like a human body with all organs effectively performing unique functions, yet needing to work synergistically towards one's overall health. Without that, any city—smart or otherwise—is likely to fail.

**How would you define a smart city? What do you think is the most important aspect of a smart city?**

For us, SMART is an acronym that stands for Sustainability, Mobility, Affordability, Resilience and Technology. A sustainable smart city is much more than a development that embraces technology; it is the city of the future which has to be net-zero on water, net-zero on energy and net-zero on waste-to-

landfill. We need to start thinking of our buildings and cities as bazaars (places of human interaction) rather than as machines (places of human habitation). So how do we redefine our urbanism as an emergence of interwoven networks? The first thing is to determine the carrying capacity of a city and define a target population based on the water and renewable energy potential. This determines the human capacity of the land. It is essential to design a city as a system and let it evolve naturally. If one become highly prescriptive about how a city should be, it doesn't allow for the changing nature of human interaction. And we cannot predict how that will evolve over the next 100 years.

It is important to design a city to be safe, where you don't build setbacks and boundary walls. Instead, you build pavements and put eyes on the street. A self-regulating society is much more effective than a police state.

**If you could implement one smart city feature in Delhi right away, what would it be?**

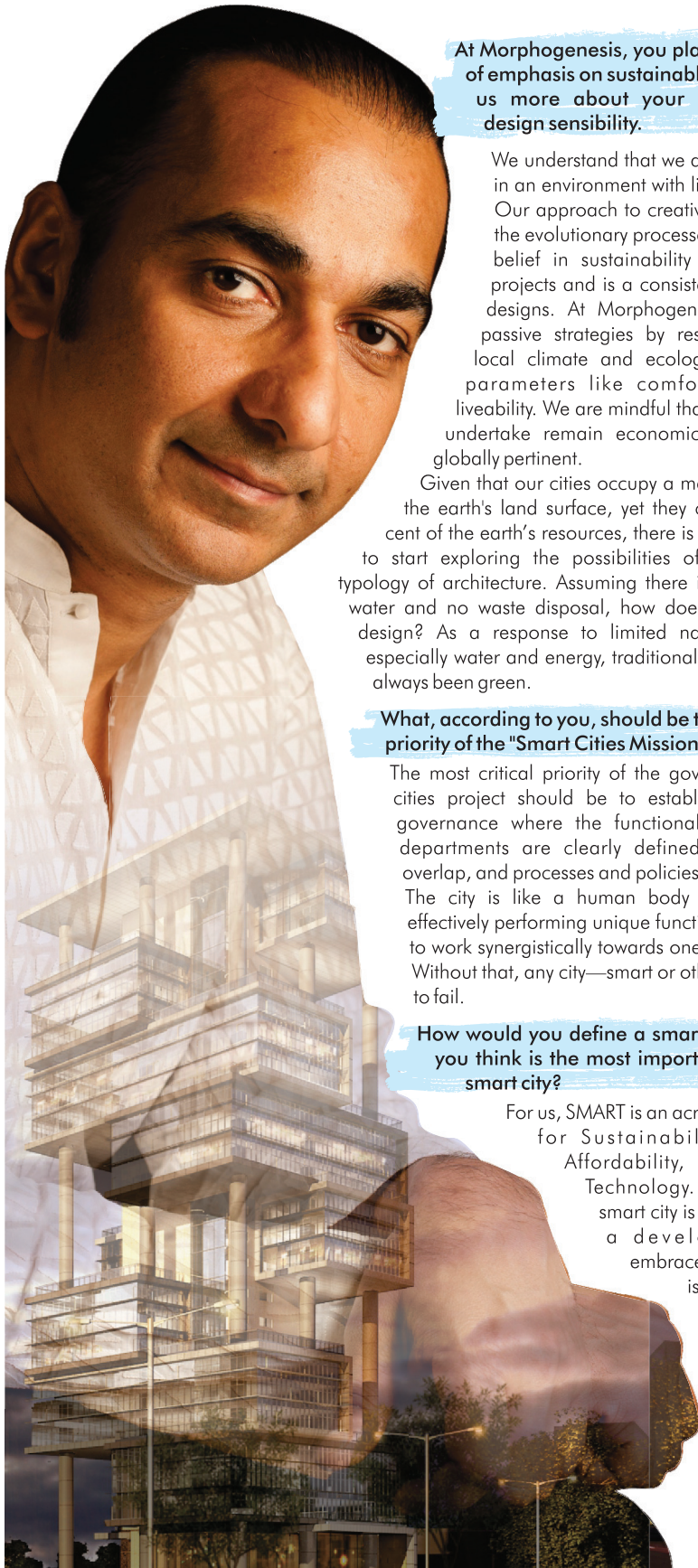
It would have to be the "Delhi Nullahs Project". By revitalising the redundant and interstitial spaces of the city, this project aims to bring together an exemplar world of governance, environment and development.

**Tell us more about the "Delhi Nullahs Project".**

The intention was to use Delhi's neglected nullah (storm water drain) network to fundamentally transform the city. Currently, nullahs are just unhygienic drains which are seen as a problem by the citizens of Delhi. They smell, breed mosquitoes, pollute the River Yamuna. However, a relatively small investment can transform them into a valuable asset for the common citizen. Since our city's sewage system is largely under capacity, most of our sewage gets dumped into the Yamuna, making it dry up. Our vision is to clean the nullahs, preserve the receding water table and create open spaces and pedestrian corridors in the area surrounding these storm water drains. On 13<sup>th</sup> January 2015, the National Green Tribunal (NGT) declared that the project shall be implemented in a phased manner and shall be called the "Maili se Nirmal Yamuna Revitalisation Project 2017".

**What is your message to aspiring architects and urban planners in India?**

We believe that architecture and design is not only a profession, it is a way of life. The commitment required is paramount, as there is a tremendous responsibility towards oneself, the environment and society at large. It is an immense opportunity to define a new emergent Indian architecture.



# FAST FORWARD »

Shaping the future means shaping ideas. And who can do this better than writers, philosophers, film-makers, artists and visionaries? Most of them have dedicated their lives to imagining the city of the future, fantasy worlds we can live in. *What's Up, Germany?* introduces visions, straight from the future, of how cities could look like, and what you can do to be a part of it. Let's walk the road ahead together!



Image: Shimizu Corporation

## THE OCEAN SPIRAL

In 2030, Arielle the Mermaid might glimpse into our living rooms! The Japanese firm Shimizu Corporation is preparing to launch a never-seen-before underwater project in the Pacific Ocean. The ₹1.67 lakh crore deep-sea eco-city with dedicated business and lifestyle zones will produce its own energy from sea resources. As it is extremely difficult to build underwater, the entire construction will happen at the sea surface. Down under just got a totally new meaning!



## NEW NEW YORK IN FUTURAMA (1999)

This animated sci-fi sitcom, favoured by kids and geeks alike, is set in New New York during the 31<sup>st</sup> century. It shows people zipping around on floating scooters and time travel boxes. But not many people know that the sitcom's name was derived from an exhibit at the 1939 New York World's Fair that took a stab at predicting how the world would look like 20 years into the future: automated highways with radio-controlled cars, vast suburbs and disc-shaped airports. It sure was ahead of its time!



## THE VENUS PROJECT

Brainchild of 100-year-old architect Jacque Fresco, the Venus Project, located in Venus, Florida, envisions a different way of how people can live together. As of now, Fresco and his team have completed a 21-acre research centre. Fresco's designs focus on a circular city with a central dome surrounded by rings of buildings. His vision is of a cybernetic city built on an eco-friendly design, with a system that works on a resource-based economy, for the good of all.

## RIVER OF GODS (2004)

Have you ever wondered how it would be like to live in India 30 years from now? Ian McDonald has it all worked out in his award-winning sci-fi novel, *River of Gods*. Set largely in and around Varanasi, it depicts a futuristic India in 2047. It is the 100<sup>th</sup> anniversary of India's independence, and the monsoon is already three years and two months late, leading to internal tensions. It's an exciting story about ancient traditions and advanced technologies like artificial intelligence and nanotechnology!

# VISIONS OF SMART CITIES



Image: Christopher Soghoian

## TAKE ACTION! BECOME A SMART CITIZEN

In our role as urban individuals, we have moved into an era of open data, crowdfunding, sharing economy and real-time democracy. Citizens all over the world have started to self-organise, create new services and find alternative ways of sharing information. The result? Exciting innovations and ideas that can improve lives, strengthen e-participation and lead to the co-creation of policies. *What's Up, Germany?* presents three ways to become a smart(er) citizen.

**Download a Smart Citizen kit:** This monitoring platform allows users to track environmental data in real time and implement that knowledge into participatory solutions in areas like traffic management, etc.

**Create solutions to improve the status quo:** A smart citizen is an active citizen. If you are unhappy with a situation and have suggestions to improve it, don't wait. Create an online poll that identifies potential solutions by asking other citizens and propose a way out to local government bodies. Spread the word via Twitter or a blog post.

**Teach, educate and spread the joy:** Not everyone is equipped to be a smart citizen from the start, but everyone can become one. You can help people figure out how to google, operate a smartphone or participate in polls and forums. That way no one will be left out.

Nowadays, smart cities is "trending". Everything around us is going to be functioning in the smartest manner possible. Smart transport, with zero pollution and advanced features like self-drive, is an exciting area for researchers and commuters. My contribution is PIXY, an Android-based hybrid electric smart car, which I designed and developed in a small workshop at home with limited resources and tools. This lightweight, pollution-free electric car is equipped with exciting features like automatic gull-wing doors, RFID access and autopilot mode. I hope to motivate the young generation to use renewable energy sources while developing future technologies.

— Lalit Kumar, inventor & developer, New Delhi

## SMARTIZEN



# THE PATHFINDERS

Call them by any name: architect, designer, policy adviser, city researcher, urban thinker. They all have one thing in common: the passion and drive to make our cities more liveable, our administration more responsive and our services more efficient.



India is moving from its villages into its cities at a blistering pace. There are opportunities, but also daunting social, environmental and economic challenges. Take urban transportation, for example.

Addressing this problem is not simple and will draw on urbanists, planners, innovators and entrepreneurs. Testing new ideas and pushing for collaboration among unlikely stakeholders is fundamental to the future of our cities. My hope is that our smart cities become thriving hubs in which people have the agency to live to their fullest potential.

— Jyot Chadha, head of Urban Innovation, Sustainable Cities, World Resources Institute (India)



Young, motivated urban thinkers are developing IT solutions to make our cities smarter. There are no limits to ideas, but urban planning systems are slow and indignant to change as fast as a young generation of thinkers want to. The smart city is a gift, a chance to transform old and slow systems and structures into a smart future. From Germany, we can learn that urban development schemes have to benefit all in order to win the citizens' support. In India, a young generation is hungry for smart change, with more policy transparency, public-private partnerships, information services. We are responsible for using this chance.

— Jakob Julian Nürnberger, architect and urban thinker, Ahmedabad



The Indian smart city is essentially an entrepreneurial city. Like entrepreneurs, cities must gain insight into their uniqueness to be differentiators in the global competition between cities, rather

than trying to be similar to each other. Technologising infrastructure provision and monitoring is moot in the Indian context, where equitable access to infrastructure is in itself a huge challenge. I wish "smartening" Indian cities would focus on openly sharing big data and analytics.

— Madhav Raman, co-founder and principal designer, Anagram Architects, New Delhi



Cities are built up over time from an infinity of small acts. They do not function like well-oiled machines but present complex organisms that are shaped by geographies, social milieus and inhabitants. The smart city concept overlooks the real drivers of cities: people. People come with messiness, as do cities. There are certain urban qualities that can only evolve with inefficiency, vacancy or unforeseeable events. In theory, the smart city concept can improve citizen participation and co-determination through open data and real-time participation technology. Currently, however, the concept is organised top-down, rather than from the bottom-up.

— Leona Lynen, city researcher, Berlin



A smart city is one where the infrastructure is aligned to the needs of its citizens, giving them fair and equal access along with high participation, while simultaneously minimising red tape. Often, there

are constraints in developing modern infrastructure in old and overcrowded cities, which is the case in most Indian cities. Making such cities function "smartly" is more about improving the efficiency and access to existing infrastructure, as against building infrastructure. In one of my projects, we make unutilised spaces in schools and colleges available for activities like sports or dance after school hours.

— Arjun Chopra, MD, in2sports India



A smart city uses digital technology to improve the lives of people. This requires strategic leadership by the administration. Highly promising smart cities not only embrace technology and innovation but also nourish the creativity of their citizens. Without young and talented tech entrepreneurs pushing to transform cities with their ideas, they cannot become truly smart on a large scale.

— Faruk Tuncer, policy advisor, Berlin



A smart city is all about building connections which transcend geography—something more deep-rooted and emotional. Better infrastructure is an integral part of building smart cities, but first comes

building awareness about existing resources and then preparing for easier accessibility and navigation. The starting point is changing our obsolete addressing system. I have co-founded a digital addressing system that creates an eight-digit alphanumeric address for every location in a city. This can form the crux of all services: transportation, retail, governance, emergency services, etc. My aim is that people should be able to travel hassle-free, thereby forming indelible connections.

— Vaibhav Belgaonkar, co-founder, Joomzee Geotracker Pvt Ltd, Mumbai



In a smart city, modern technology, especially smart devices, connect people with their surrounding areas. Citizens should be offered easily accessible services to keep them informed and their grievances should be taken seriously. City planners often rely on theoretical concepts and best practices in other cities, and want to adopt them without taking into account the unique attributes of their own cities and the peoples' needs. They expect public participation via outdated procedures like public gatherings and filling forms. This can be prevented by enabling connected citizens to interact with the administration and have a say in city planning. We will then have more liveable smart cities.

— Michael Witte, public relations and event advisor, European Geography Association

What is the city  
but the people?

— William Shakespeare



# WHAT'S UP, GERMANY?'S SURVIVAL KIT

**LE CORBUSIER**, ARCHITECT & URBAN PLANNER

The materials of city planning are sky, space, trees, steel and cement—in that order and in that hierarchy.

**REBECCA SOLNIT**, AUTHOR

In great cities, spaces as well as places are designed and built: walking, witnessing, being in public, are as much part of the design and purpose as is being inside to eat, sleep, make shoes or love or music. The word citizen has to do with cities, and the ideal city is organized around citizenship—around participation in public life.

**EDUARDO PAES**,  
MAYOR OF RIO DE  
JANEIRO

Making cities smart is the first step towards making them wiser. A wise city is one that is equitable, sustainable and resilient.

**ANTHONY TOWNSEND**, SENIOR RESEARCH  
SCIENTIST, NEW YORK UNIVERSITY

Smartphones in hand... we are reorganizing our lives and our communities around mass mobile communications.

**JANE JACOBS**, URBANIST & ACTIVIST

Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.

**ANGELA O'BYRNE**,  
ARCHITECT

I think this is an opportunity to rethink some of the urban planning.

**PATRICK GEDDES**, SOCIOLOGIST & TOWN PLANNER

A city is more than a place in space, it is a drama in time.

**LEWIS MUMFORD**, SOCIOLOGIST

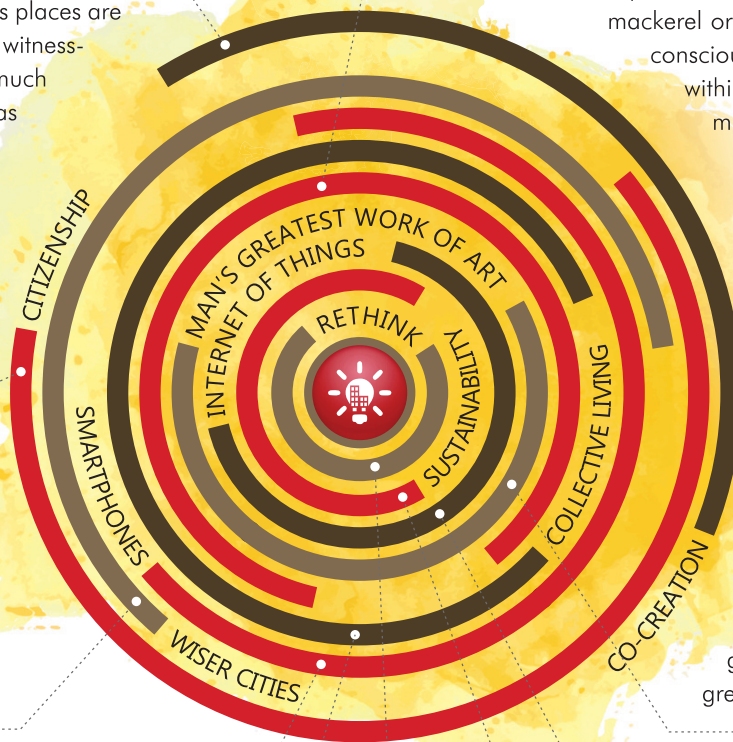
The city is a fact in nature, like a cave, a run of mackerel or an ant-heap. But it is also a conscious work of art, and it holds within its communal framework many simpler and more personal forms of art. Mind takes form in the city; and in turn, urban forms condition mind. For space, no less than time, is artfully re-organized in cities... The city is both a physical utility for collective living and a symbol of those collective purposes and unanimities that arise under such favouring circumstance. With language itself, it remains man's greatest work of art.

**KENZO TANGE**, ARCHITECT

Technological considerations are of great importance to architecture and cities in the informational society.

**HERBERT GIRARDET**,  
ECOLOGIST & WRITER

The cities of the 21<sup>st</sup> century are where human destiny will be played out, and where the future of the biosphere will be determined.

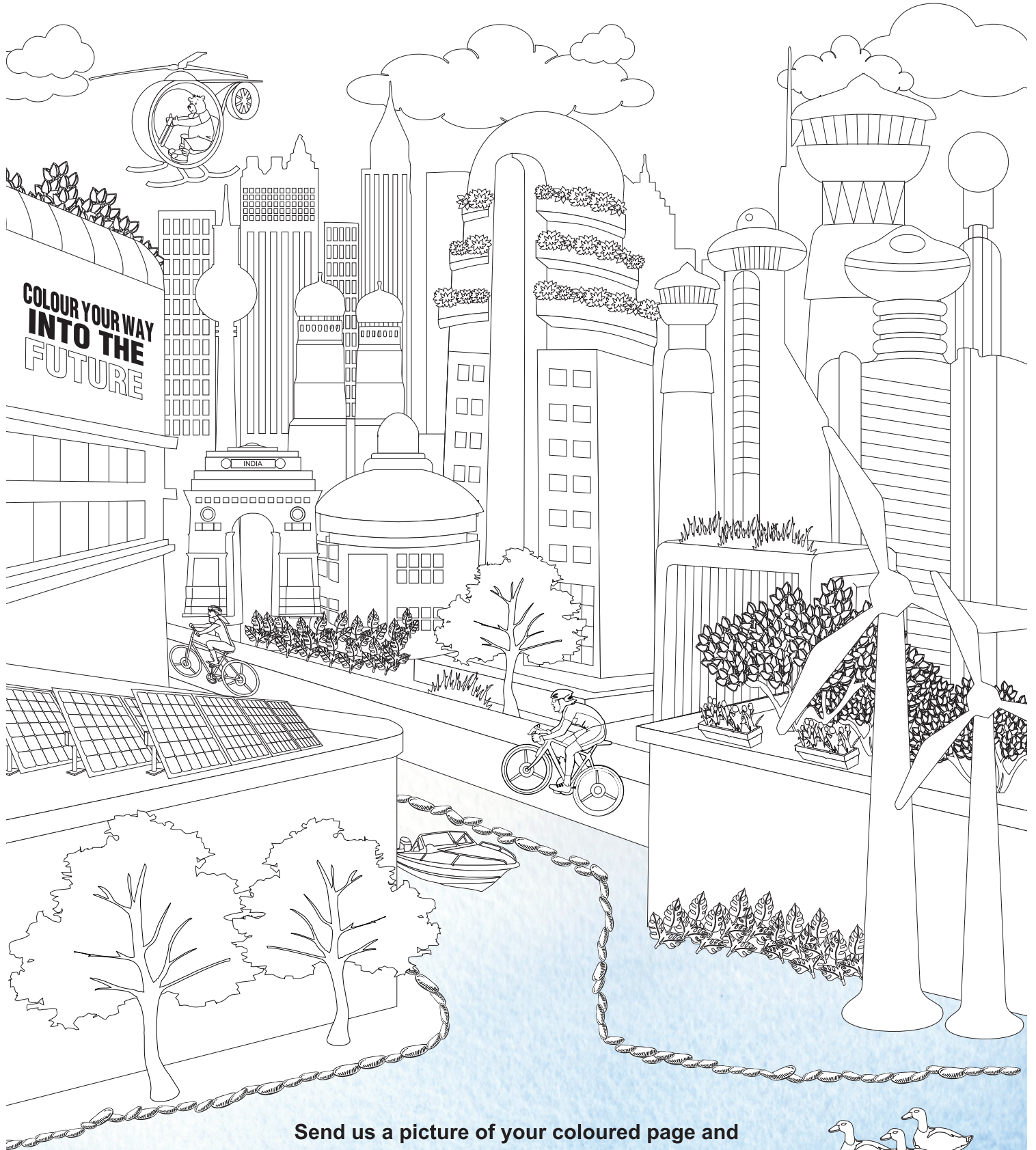


Smart villages are the future of India. There is great demand for reliable and clean energy in rural India, especially for the 300 million villagers without access to electricity. New technologies like blockchain, Internet of Things (IoT) and small-scale energy generators offer low-cost solutions for growing a smart energy network, where generation, storage, control and ownership can be distributed among all the villagers. As a result, the network becomes reliable and can be autonomously grown by the users themselves. Starting today, smart villages can leapfrog the outdated centralised energy network and set an example for future smart cities.

—Evan Mertens, co-founder, Rural Spark Energy India, New Delhi

SMARTIZEN





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