

SMART CITIES MISSION IN INDIA

Footprints of International Financial Institutions

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Preface

While too little details are available for an informed public debate on Smart City Mission (SCM), there's a lot of euphoria around it. Notwithstanding the fact that only less than 10% of the urban area is covered under smart cities as area based development plans, it is promoted and propagated as a panacea for all the problems facing the urban areas.

Deliberately or not, a lot of information and details are withheld from public in a form and language they can understand and generate a public debate. As in the case of other developmental projects, SCM is also promoted behind the din and dust of the propaganda and often misleading information.

In Smart Cities, not just corporations, pushing their business interests in technology, telecommunications, construction, software and hardware who have committed and moving ahead with their activities, but even financial institutions both national and international have started investing in it. These investments not only support specific projects, but also push policy recommendations to ensure the urban infrastructure transformation, regulatory framework and governance.

This booklet is an attempt to look at the investments of international financial institutions and bi-lateral agencies in SCM. This small effort, we believe, will enrich the discussions on the feasibility and ramifications of Smart Cities, wherever it is happening. We are planning this as one amongst a series of such booklets. We will immensely benefit from your comments and inputs to improve this, and future such publications.

Joe Athialy

Centre for Financial Accountability

Brief Summary

This booklet is a first in a series that looks to provide an overview of the smart cities at a conceptual level, smart cities mission in India, development of smart cities globally, the role of International Financial Institutions (IFIs) and bilateral agencies in promoting smart city projects in various cities across the world and India that includes digitalisation, infrastructure development and public services delivery by private corporations. It discusses the financing mechanisms proposed and implemented for delivering smart city projects, the overall costs involved in building a smart city, as well as the budgetary allocations for smart city projects in India in past four years.

The booklet looks into the role of IFIs in promoting smart city projects through various development programs, financial support, loans, technical assistance, advisory services, etc, extended to the smart cities initiative, as well as the policy changes and reforms recommended to be undertaken for transitioning to implement the idea of smart cities as envisioned by these international agencies. It specifically looks into the project and policy interventions by the World Bank, IFC, ADB and AIIB in India related to smart cities projects. It maps and identifies specific projects which look to provide policy, financial or other support to smart city projects.

In the later part we will cover the role, collaborations, agreements, partnerships, technical support, finances and financial mechanisms that the bi-lateral agencies and private investors are using to gain a foothold in the urban infrastructure projects in building smart cities across India.

Introduction

When researching the role of International Financial Institutions (IFIs) within Indian Smart City development, a comprehensive mapping of the role and underlying motives of IFIs was needed. The mapping and research makes a common theme itself evident. The sheer scale of the Indian Smart Cities Mission (SCM) and the costs that such a plan brought with it already present issues in funding and implementation. Redeveloping 100 Indian cities to make them “smart” would require at least Rs 98,000 crore, which is a conservative estimate. But the desire to build smart cities is easy to understand given the techno-centric society we now live in. Smart cities are being so heavily invested in due to the popular technocratic belief that smart technology and data analysis will solve most of a city’s problems. IFIs are heavily supporting this development model, but one question was why do IFIs advocate for smart so heavily?

The research for this booklet led me to see that the SCM allows private corporations to play a large role in urban development while also allowing private companies to diversify their assets. IFIs expound that the private sector is the solution to the city’s problems and further claim that Public Private Partnerships (PPP) are the most efficient model for implementing such large-scale development models. But historically PPPs have been problematic for the public sector causing more harm than good but they are still being touted as the best implementation option. The intense interest in having the private sector drive the smart city agenda has brought the larger and more important question of, “who are smart cities really meant to benefit?” These questions and lines of analysis were present throughout the research. The mapping of IFIs and smart cities is meant to serve as an objective look into the intricate relationship that smart cities and IFIs share as 100 cities are redeveloped in India.



On the first anniversary of the Smart City mission in June 2016, PM Narendra Modi launched a slew of new proposals in Pune. PM strongly stated that urbanization should be treated as an opportunity and not a problem or a challenge and smart cities is a step towards mitigating poverty. Photo credit: PMO India

What is a smart city?

The Smart Cities Mission of the Government of India defines a smart city as, “there is no universally accepted definition of a smart city. It means different things to different people. The conceptualisation of Smart City, therefore, varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. A smart city would have a different connotation in India, than, say, Europe. Even in India, there is no one way of defining a smart city”.

The definition goes like this: “In the approach of the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of ‘Smart’ solutions. 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 the aspiring cities.”

“The core infrastructure elements in a smart city would include:

- i. adequate water supply,
- ii. assured electricity supply,

- iii. sanitation, including solid waste management,
- iv. efficient urban mobility and public transport,
- v. affordable housing, especially for the poor,
- vi. robust IT connectivity and digitalization,
- vii. good governance, especially e-Governance and citizen's participation,
- viii. sustainable environment,
- ix. Safety and security of citizens, particularly women, children and the elderly, and
- x. Health and education”¹.

A simple search on the web can give varied definitions of a smart city such as “some define the smart city as an urban environment that is elegantly efficient, grander than the messy urban environments we live in today. For firms in the business of selling controllers, sensors, and servers—the technology to drive smart systems—the smart city is a new market for urban management. It is an urban form to be sold, resold, modified or augmented to make money. Many analysts and practitioners, however, are more modest in their definitions, limiting ‘the smart city’ to a few approaches that use publicly available data to solve discrete problems, such as waste management and traffic control”².

As quoted in a special issue published by Cambridge Political Economy Society on smart cities, the authors state that “they define the smart city by two essential attributes. First is the use of technologies to facilitate the coordination of fragmented urban sub-systems (for example, energy, water, mobility, built environment). In a second and more futuristic definition, smart cities are urban places where the lived experience calls forth for a new reality”.

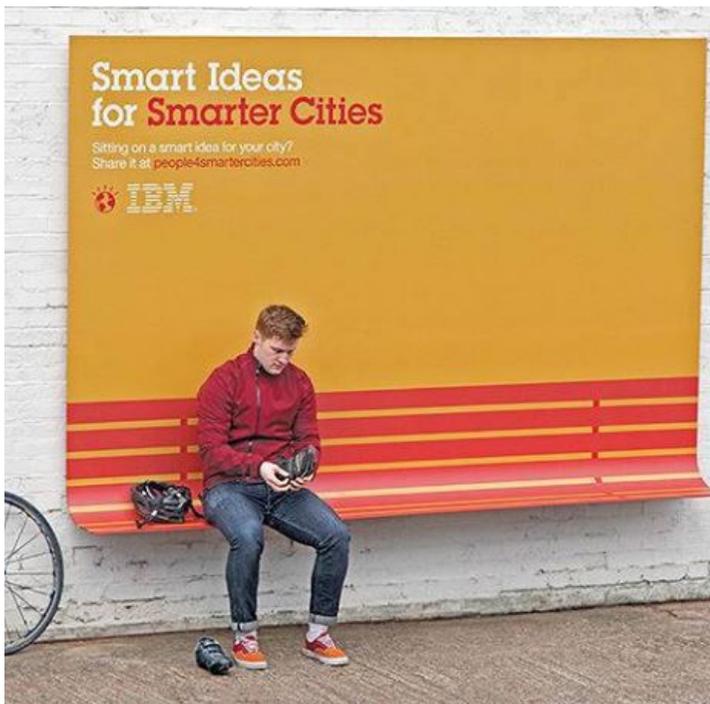
Further adding, “Most smart cities are about fixing things by adding off-the-shelf technology to existing functions such as transportation planning to make existing systems more efficient, predictable and, in rare cases, redeployable with re-programming. In the vast majority of cases, smart cities are about renovation rather than about building wholly new urban environments and, as such, they will all be different because of the exigencies of municipal budgets and political choices”.

Interestingly, it also gives an indication of the origins of the smart city concept by elaborating that the emergence of such concepts and technological push over a period of time in the past years have followed the periods of economic downturn and therefore requires a push for creating new markets and demand for such products. “...The limits of agreement around the

¹ <http://www.smartcities.gov.in/upload/uploadfiles/files/What%20is%20Smart%20City.pdf>

² Thinking about smart cities, Cambridge Journal of Regions, Economy and Society 2015, 8, 3–12, URL - <https://dusp.mit.edu/sites/dusp.mit.edu/files/attachments/publications/Smart%20Cities%20CJRES%20201415.pdf>

concept arise in part because, as with prior moments when the rate of economic growth has stumbled, economic actors look for new markets to deploy existing technology. They grope for a synthesis that will kick off a sustained round of job generation and capital investment. For example, one progenitor of the smart city, the ‘intelligent city’ dates back to the 1980s, another period of sluggish economic growth, when, following on the heels of the early 1980s banking crisis, economic development professionals searched for another source of lift in the economy...”³



IBM's Smarter Cities Campaign. Photo credit: O&M

‘Information Age’⁴ in an article reports an interesting story of perhaps the beginning of the smart cities programme. It says that former US president Bill Clinton challenged CISCO, an electronic network equipment manufacturer, to use its technical expertise to make cities more sustainable in 2005. In 5 years CISCO developed a program called Connected Urban Development. Later, in 2010, CISCO began its

Smart and Connected Communities division to commercialise the products and services it had developed during the program. In 2008, IBM too launched its Smarter Planet Initiative, a program to explore the application of instrumentation, interconnectedness and intelligence (i.e. sensors, networks and analytics). The next year, IBM began a program to use technologies in an urban environment called as Smarter Cities Program.

IBM implemented its first project in Rio, to set up an emergency response centre, followed by another in Glasgow, to analyse fuel poverty. CISCO projects were in New York and Songdo city in South Korea. The German city of Hamburg is also being partnered by CISCO to launch several projects within company’s Smart+Connected Communities program. The projects

³ Ibid

⁴ <https://www.information-age.com/ibm-cisco-and-the-business-of-smart-cities-2087993/>



include smart street lighting, a smart traffic system, environment and infrastructure sensing, and a “virtual citizen services solution,” as well as developing the Port of Hamburg into a “smart port”⁵. Companies like IBM and CISCO have realised that smart cities projects rely on collaboration between multiple authorities or stakeholders and have built these into their commercial strategies. They partner with engineering firms, telecommunications operators or facilities management companies for smart city projects.

As is being discussed, developing smart cities is a global phenomenon, primarily pushed by technology, telecommunications, construction, software and hardware companies supported by IFIs and bilateral trade promoting agencies. Beginning from cities in North America and Europe globally, cities such as Barcelona, Masdar, Songdo, Amsterdam, New York, San Francisco, London, Singapore and others have been developed into smart cities in recent years. The smart city concept is now being implemented in several Asian, African and Latin American cities like Laos, Lima, New Delhi and others.

⁵ <https://constructech.com/smart-cities-across-the-globe/>

Smart Cities Mission in India

The Smart Cities Mission, a Government of India program for urban development, is projected as a high profile initiative which will transform the urban landscape in India. In the first phase of the Smart Cities Mission, As many as 100 cities of the country are targeted to be Smart. Similarly, 500 cities have been targeted to be developed under AMRUT. The mission was launched on 25 June, 2015 by Prime Minister Narendra Modi. The provision of budget for the Smart City project by the Central Government is Rs 48,000 crore and Rs 50,000 crore for AMRUT⁶.

For the first phase under the Smart City program, 20 cities have been selected for this through the ‘Smart City Challenge Competition’ in January 2016. In the later phases, 79 cities have been further selected to be part of the mission, one city slot remains empty. To make these cities smart approximately Rs 96,000 crore would be spent by the government in the next 5 years. Out of this Rs 48,000 would come from the central kitty and as per the conditions of the program a similar amount would be borne by the state governments.

In the selected cities the central government would invest Rs 100 crore and the matching amount would be spent by the state government in the form of a grant. The projects at the municipal level under the mission would be implemented through a Special Purpose Vehicle (SPV) which would be a limited company to keep it uncoupled from the larger municipal governance and democratic processes. The SPV would be formed based on a tripartite agreement between the central government, state government and the municipal body. For monitoring, a national council is being formed which would be part of the US-based Smart Cities Council⁷.

Under the mission, four modes have been proposed to undertake the development of a smart city--retrofitting, redevelopment, greenfield development and pan city development. These modes would be used to develop around 500 acres of the selected city where infrastructure already exists with the help of smart internet based applications. The Smart Cities Mission strategy⁸ gives the following definition of retrofitting, redevelopment, greenfield development and pan city development:

Retrofitting -- will introduce planning in an existing built-up area to achieve smart city objectives, along with other objectives, to make the existing area more efficient and liveable. In

⁶ www.smartcities.gov.in

⁷ <https://smartcitiescouncil.com/>

⁸ <http://www.smartcities.gov.in/content/innerpage/strategy.php>

retrofitting, an area consisting of more than 500 acres will be identified by the city in consultation with citizens. Depending on the existing level of infrastructure services in the identified area and the vision of the residents, the cities will prepare a strategy to become smart. Since existing structures are largely to remain intact in this model, it is expected that more intensive infrastructure service levels and a large number of smart applications will be packed into the retrofitted smart city.

Redevelopment -- will effect a replacement of the existing built-up environment and enable co-creation of a new layout with enhanced infrastructure using mixed land use and increased density. Redevelopment envisages an area of more than 50 acres, identified by Urban Local Bodies (ULBs) in consultation with citizens.

Greenfield development -- will introduce most of the Smart Solutions in a previously vacant area (more than 250 acres) using innovative planning, plan financing and plan implementation tools (e.g. land pooling/land reconstitution) with provision for affordable housing, especially for the poor. Greenfield developments are required around cities in order to address the needs of the expanding population.

Pan-city development – envisages application of selected Smart Solutions to the existing city-wide infrastructure. Application of Smart Solutions will involve the use of technology, information and data to make infrastructure and services better.

The mission strategy further states that “the smart city proposal of each shortlisted city is expected to encapsulate either a retrofitting or redevelopment or greenfield development model, or a mix thereof and a pan-city feature with Smart Solution(s). It is important to note that pan-city is an additional feature to be provided. **Since smart city is taking a compact area approach, it is necessary that all the city residents feel there is something in it for them also. Therefore, the additional requirement of some (at least one) city-wide smart solution has been put in the scheme to make it inclusive**”⁹.

⁹ <http://www.smartcities.gov.in/content/innerpage/strategy.php>

The mission also seeks convergence with other Central and State Government schemes. It states: "...there is a strong complementarity between the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and Smart Cities Mission in achieving urban transformation. While AMRUT follows a project-based approach, the Smart Cities Mission follows an area-based strategy. Similarly, great benefit can be derived by seeking convergence of other Central and State Government Programs/Schemes with the Smart Cities Mission. At the planning stage itself, cities must seek convergence in the SCP with AMRUT, Swachh Bharat Mission (SBM), National Heritage City Development and Augmentation Yojana (HRIDAY), Digital India, Skill Development, Housing for All, construction of museums funded by the Culture Department



and other programs connected to social infrastructure such as Health, Education and Culture”¹⁰.

For the selection of smart cities under ‘smart city challenge round 1’, 20 cities across the country were selected for the smart cities mission, under the fast track round. Another 13 cities were selected; under round 2, 27 cities were selected, under round 3, 30 cities were selected and under round 4, 9 cities were selected for the mission. This brought the total number to 99 and the last city to be selected for the mission at 100 was Shillong. The detailed list of number of cities allocated to states based on urban population and number of statutory towns¹¹ are as follows:

State/ UT (No. of cities): A & N Islands (1), Andhra Pradesh (3), Arunachal Pradesh (1), Assam (1), Bihar (3), Chandigarh (1), Chhattisgarh (2), Daman & Diu (1), Dadra & Nagar Haveli (1), Delhi (1), Goa (1), Gujarat (6), Haryana (2), Himachal Pradesh (1), Jammu & Kashmir (1), Jharkhand (1), Karnataka (6), Kerala (1), Lakshadweep (1), Madhya Pradesh (7), Maharashtra (10), Manipur (1), Meghalaya (1), Mizoram (1), Nagaland (1), Odisha (2), Puducherry (1), Punjab (3), Rajasthan (4), Sikkim (1), Tamil Nadu (12), Telangana (2), Tripura (1), Uttar Pradesh (13), Uttarakhand (1), West Bengal (4), Grand Total (100).

¹⁰ <http://www.smartcities.gov.in/content/innerpage/convergence-sp.php>

¹¹ http://www.smartcities.gov.in/upload/uploadfiles/files/No_%20of%20Smart%20Cities%20in%20each%20State.pdf

Financing smart cities

Finances and financing mechanisms form a crucial aspect for the smart cities mission which is going to be a capital intensive urban infrastructure development program. The Central Government and international and domestic financial institutions are proposing several measures to bring in the huge amount of funds that would be needed to build a smart city in the existing urban spaces. The government proposes to generate funds for smart cities mission implementation through the current sources income for municipal bodies by increasing property tax, professional tax, entertainment tax, advertisement tax, entry tax among others.

Additionally, funds would also be available on implementation of the recommendations of the 14th Central Finance Commission. These recommendations include vacant land tax, user charges for water, electricity, telecom, gas, parking fees, tax on public transport and charges on

In an interview to CNBC-18, the founder and director of Smart Cities Council in India, Pratap Padode, estimated that the smart cities mission would require an expenditure of Rs 60 lakh crore in the next 20 years.

changes in land and building use. It has also been suggested that water supply and sewage should be charged separately from property tax and the charges should be increased to such levels that at least operation and maintenance cost is recovered. The increases should also be linked to inflation.

The user charges should be recovered based on the quality of the services delivered. It has been recommended that public services like water supply, sanitation, sewage, transport, etc, must be delivered by private partners through PPP mode. The other source for generating funds that has been suggested are municipal bonds, green bonds, energy conservation bonds and pooled finance mechanisms¹².

The total expenditure for building 100 smart cities in India is not clear as yet. To start with, the Government of India has allocated Rs 98,000 crore for the mission for the next five years. In a interview to CNBC-18, the founder and director of Smart Cities Council in India, Pratap Padode, estimated that the smart cities mission would require an expenditure of Rs 60 lakh crore in the next 20 years¹³.

The Urban Development Ministry of India has estimated a cost of Rs 7 lakh crore (approximately US \$105 billion) to develop '100 Smart Cities' over the next 20 years. The cost of building a smart city is quite high, and can be done only through public-private models. Given the huge cost, the opportunities too will be galore for corporates to encash¹⁴.

¹² <http://smartcities.gov.in/upload/uploadfiles/files/Financing%20of%20Smart%20Cities.pdf>

¹³ <https://worldbusinesss.blogspot.com/2015/04/pvt-cos-taking-huge-interest-in-projs.html>

¹⁴ <https://india.smartcitiescouncil.com/article/smart-cities-be-build-substantial-cost>

A joint study by Assocham-EY has estimated that in a hyper-connected India, the Internet of Things (IoT) has the potential to reach 2 billion connections, and unlock revenues of US \$11.1 billion by 2022¹⁵.

The High Powered Committee on Urban Infrastructure has estimated that for the period of 20 years the public services in smart cities would require an investment of Rs 7,00,000 crore, close to Rs 35,000 crore per year for 100 smart cities with an average population of 10 lakh¹⁶. It appears that this would be recovered through the user charges for infrastructure built and services delivered.

The global smart city market will be valued at US \$1.565 trillion in 2020. Over 26 Global Cities are expected to be Smart Cities in 2025, with more than 50% of these smart cities from Europe and North America¹⁷.

¹⁵<https://telecom.economictimes.indiatimes.com/news/iot-to-unlock-revenues-worth-11-1-billion-by-2022-study/67250699>

¹⁶https://www.jstor.org/stable/24890283?read-now=1&seq=8#page_scan_tab_contents

¹⁷<https://dusp.mit.edu/sites/dusp.mit.edu/files/attachments/publications/Smart%20Cities%20CJRES%20021415.pdf>

Budget Utilisation under Smart Cities Mission

The 22nd report of the Standing Committee on Urban Development (2017-18) of the 16th Lok Sabha on the 'Demand for Grants' (2018- 19) of the Ministry of Housing and Urban Affairs, pointed out that “though most of the flagship programs of the Government, namely Swachh Bharat Mission, Smart Cities, AMRUT, PMAY, DAY-NULM, HRIDAY, are to be carried out by your Ministry, the percentage share of Central Government budget allocated to MOH&UA has gone down from 1.88% in 2017-18 to as low as 1.71% in 2018-19. No substantial increase in overall allocation is made despite mandated to implement highly ambitious missions like SBM, & Smart Cities, 'Housing for All' etc. In fact, the allocations made over the years is not even half of what was proposed by the MOH&UA viz. in the year 2015-16 it was just 31.1%, in 2016-17 it was 43.73% and in 2018-18 it was 48.50%”¹⁸.

The report gives the funds available for the Smart Cities Mission 2015-16 onwards (Rs crore):

Year	Budget Estimate (BE)	Revised Estimate (RE)	Actuals
2015 – 16	2,020.00	1496.20	1469.38.51
2016 – 17	3,205.00	4,598.50	4493.64
2017 – 18	3,949.50	3,989.50	3,995.21
2018 – 19	6,169.00		(upto 09.02.18)

Considering the figures given in the above table, the committee pointed out that “as against the Mission Support of Central Government to the tune of Rs. 48,000 crore for five years, the total BE is only over Rs. 15,000 crore and RE in first three years is still lower at over Rs. 10,094 crore and expenditure is even lower than that”.

The committee also observed that the budget allocation for Mission for Development for 100 Smart Cities has been increased from Rs.3989.50 crore in 2017-18 to Rs. 6000.00 crore. in 2018-19.

The ministry said in its response to the observations: “To give the first installment of Rs. 200 crore per city for 99 cities selected, Rs. 13646.30 crore is required in FY 2017-18 against which only Rs. 3989.50 crore has been allocated at BE 2017-18. Additional requirement were sought through 1st and 2nd Supplementary as well as at RE stage. However, no additional fund has been provided which resulted increased allocation for BE 2018-19.”

¹⁸http://164.100.47.193/lsscommittee/Urban%20Development/16_Urban_Development_22.pdf

Further, the committee expressed its concern that even after 3 years into the mission the majority of the identified projects are still at the stage of preparation of detailed project reports and enquired as to how the Ministry will achieve the targets.

The ministry replied: “It may be pointed out that total Smart City Projects for identified 99 cities amounts to Rs. 2,04,000 crore. Among the 99 cities, 86 cities have already got SPV in place and 64 have the PMC working there. The last 39 cities have been selected in the current year. Among those selected earlier, the total projects amounting to Rs. 5265 crore have already

As of December 2017, Rs 9860 crore were released to the 60 cities selected under the mission. The budget utilised out of the total released funds is Rs 645 crore, i.e. around 7% of the total released funds.

been fully or partially completed. This is likely to grow to Rs. 6438 crore by the end of June, 2018. Further, projects worth Rs. 15,992 crore are already grounded and at various stages of progress. Additional projects worth Rs. 19,070 crore are under tendering. It may be mentioned that 4 cities have already have Command and Control centers and another 26 are under progress.

Various other impactful projects like Smart Roads, Smart Parks, Smart Lighting, Heritage Improvement, Solar Lighting, Bicycle Sharing and Wi-fi Facility etc, are under way.”

It has also been reported that under the mission, “as many as 534 projects worth Rs. 10,116 crore have been completed and implementation has commenced for 1,177 projects worth Rs 43,493 crore while tendering has started for 677 projects worth Rs 38,207 crore. The progress is with respect to implementation of projects pertaining to smart solutions, smart roads, smart water and solar rooftops”.



Madhya Pradesh launched the Integrated Control and Command Centre (ICCC) in Bhopal for all the seven smart cities in the state Bhopal, Indore, Gwalior, Ujjain, Satna, Jabalpur, and Sagar. Photo credit: Getty Images

“For smart Command and Control centres, projects worth Rs 1,558 crore in 11 cities have been completed while projects worth Rs 3,049 crore in 29 cities are under progress. Projects worth Rs. 2,730 crore in 21 cities have been tendered. Smart Roads projects worth Rs. 228 crore in four cities have been completed while projects worth Rs 3,819 crore in 34 cities are under progress. Projects worth Rs. 2,069 crore in 10 cities are already tendered, as per Housing and Urban Affairs ministry data”¹⁹.

Reports also state that “as of December 2017, Rs 9860 crore were released to the 60 cities selected under the mission. The budget utilised out of the total released funds is Rs 645 crore, i.e. around 7% of the total released funds. The figures released by MoUD show that Rs 196 crores were released to 40 cities each under the mission. The figures further show that Ahmedabad was top of the list spending Rs 80.15 crore, second was Indore spending Rs 70.69 crores, Surat spent Rs 43.41 crore and Bhopal spent Rs 42.86 crore under the mission. It was also revealed that cities like Aurangabad utilised Rs 85 lakh, Andaman and Nicobar Rs 54 lakh and Ranchi Rs 35 lakh of the allotted budget”²⁰.

¹⁹<https://www.moneycontrol.com/news/business/real-estate/budget-2019-fm-piyush-goyal-enhances-allocation-for-smart-cities-by-7-3459301.html>

²⁰<http://thewirehindi.com/30105/data-reveals-only-7-percent-of-released-funds-spent-so-far-under-smart-city-mission/>

IFIs, Bi-lateral Agencies, TNCs and Smart Cities in India

The International Financial Institutions (IFIs) like the World Bank, Asian Development Bank (ADB), International Finance Corporation (IFC), Asian Infrastructure and Investment Bank (AIIB) have shown considerable interest in financing the smart cities mission. The support extended by IFIs for urban infrastructure development projects such as smart cities is through different mechanisms varying from policy advice, project financing, transaction advisory, collaboration with municipal bodies and mobilizing private companies among others.

In addition to the IFIs several bi-lateral agencies and private companies are also looking forward to technical collaborations, knowledge exchanges, advisory services, as well as investments in the urban infrastructure projects under the smart cities mission. Bilateral agencies from France, Germany, US, UK, Japan, Singapore and others have either shown inclination or have taken steps to collaborate with cities in India for smart city projects.



German Ambassador to India Dr Martin Ney at the inauguration of Smart City Innovation Lab in Kochi. Photo credit: Deccan Chronicle

A Memorandum of Understanding (MOU) has been signed between India and Germany for collaboration on sustainable urban development and smart cities²¹.

It has also been reported that Germany would partner with India to develop Kochi, Bhubaneswar and Coimbatore as smart cities²².

Meanwhile, in support of the Smart Cities initiative, the US Trade and Development Agency (USTDA) would be bringing together private sector expertise, technology solutions and best

²¹<https://www.geospatialworld.net/news/india-germany-sign-mou-for-smart-city-cooperation/>

²²<https://www.dnaindia.com/business/report-germany-partners-with-india-to-develop-kochi-coimbatore-bhubaneswar-as-smart-cities-2186651>

practices to mobilise smart city development in Ajmer, Allahabad, and Visakhapatnam. USTDA will host a series of reverse trade missions to connect officials from Uttar Pradesh, Rajasthan and Andhra Pradesh and the cities of Allahabad and Ajmer, to best practices and technologies²³ of the US.

Similarly, the French government has signed a MOU for developing Chandigarh, Puducherry and Nagpur as smart cities²⁴.

IE Singapore, a program of the Singapore Ministry of Trade and Industry to help local companies to improve their operations outside Singapore, has signed a MOU with the Pune Municipal Corporation to assist with the implementation of its smart city projects. The MoU is expected to improve the city's management of water, wastewater, energy and transport infrastructure. IE Singapore has also previously signed an MoU on smart city projects with the Indian states of Rajasthan and Gujarat²⁵.

The UK Trade & Investment (UKTI) along with the Confederation of Indian Industries (CII) and India Electronics and Semi-conductor Association (IESA) are organising smart city roundtables to jointly explore opportunities between India and the UK in the development of Amaravathi, Pune and Indore smart cities²⁶.

Not to be left behind, Japan has signed a pact to develop Varanasi into a smart city by using the experience of Kyoto²⁷.

In addition to IFIs and bi-lateral agencies the lead smart city advocates include several leading Trans National Corporations (TNCs). They are involved in promoting the smart cities concept across the world. These include²⁸ – computer hardware, software and IT consulting company, IBM, network equipment and optical network manufacturer, CISCO, electricity, gas and water meter manufacturing company, Itron, heavy electrical equipment manufacturer, General Electric, computer and hardware manufacturers, Micorsoft and Oracle, smart grid network and communications network company, Silver Spring Network, Water Resources Management Group, energy and Internet of Things (IoT) manufacturing companies, AGT International and ABB, beverage manufacturer, South Africa Breweries, Japanese companies Hitachi and

²³<https://obamawhitehouse.archives.gov/the-press-office/2016/06/07/fact-sheet-us-india-economic-cooperation-and-people-people-ties>

²⁴https://www.business-standard.com/article/economy-policy/france-will-partner-india-to-build-three-smart-cities-116012500034_1.html

²⁵<https://www.smart-energy.com/news/smart-city-projects-ie-singapore-pune/>

²⁶<https://www.gov.uk/government/news/uk-india-can-make-great-smart-cities-together>

²⁷<https://timesofindia.indiatimes.com/india/India-Japan-sign-MoU-to-develop-Varanasi-into-smart-city/articleshow/41267829.cms>

²⁸<https://smartcitiescouncil.com/member-levels/global-lead-partners>

Toshiba, French company Schneider Electric, Chinese Huawei, Swedish company Erickson, Germany's Siemens, among others.

These TNCs appear to be the major drivers in the process of building smart cities across various countries across the world.

Industry forums like the Smart City Council, Smart City Expo World Congress, www.smartgridnews.com, www.indiasmartgrid.org are also involved in promoting the smart cities concept to various developed and developing country governments. Jesse Berst, the chief

analyst of newsletter www.smartgridnews.com published by US-based electrical equipment manufacturer, S&C Electric Company, heads the Smart City Council. The council targets building of 5000 smart cities across the world. The council includes US-based energy, water and transport companies. The council is a coalition of experienced experts involved in building smart cities.



Oracle has partnered with Maharashtra to build a Center of Excellence to develop and test various smart city services. Safra Catz, CEO, Oracle with Devendra Fadnavis, the chief minister of Maharashtra at the at Oracle OpenWorld 2016. Photo credit: ue Nam, Hartmann Studios/Compass

The smart city council involves 80 independent experts, 2 national laboratories, 10

universities from 6 countries and climate and environmental experts. The council has organized smart city conventions since 2015 in cities like Barcelona and Puebla. The World Bank had organized a workshop in 2012 in Washington DC titled 'Smart Cities for All', a report presented in the workshop was titled 'Planning, Connecting and Financing Cities' which outlined the framework for building smart cities²⁹.

The following sections maps and discusses IFI projects supporting smart city projects in India, with details of policy recommendations that comes with each project.

The World Bank

The World Bank has been at the forefront of promoting the smart cities concept across various developing countries. The Bank is considering a loan of US \$500 million through its proposed

²⁹<https://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-9839-5>

Urban Reforms Program (AMRUT Plus) for smart cities mission and other urban development projects in various states. The Project Information Document³⁰ states: “The proposed operation directly contributes to one of the key objectives of the 2013-2017 Country Partnership Strategy which is to support India’s urban transformation. Also, the future of cities is very prominent in India’s Systematic Country Diagnostic (SCD) currently under preparation.”

It further states that “the World Bank has a history of over ten years of engagement in supporting urban and local government reforms in India through numerous past and ongoing operations at both the national, state and local government levels. This local, regional, and international experience of the Bank is widely recognised by the GoI that continues to see the Bank as a strong partner and knowledge-broker in the urban and local government sector”.

The project document observes, “The self-administered check-list approach for the monitoring of reforms has not led to real institutional development and governance improvements. For instance, one of the priority reform activities under AMRUT was to devolve the functions and funds as per 74th CA. In response to this, most states reported that all functions have been devolved to ULBs by simply attaching a Government Order as evidence. However, this did not change the situation on the ground, where in many states, parastatal agencies or state departments continue to perform the same municipal functions.”

About program implementation under the proposed loan, it states: “The proposed operation will be financed through a hybrid of a Program for Results (PforR), which will be referred to as “the Program” and an Investment Project Financing (IPF) instrument. The dominant modality will be the P for R which is the most suitable instrument for a reform-based program. The P for R will finance policy reforms at the state level as well as the development of an incentive-based grant system to strengthen the institutional systems and capacities at the city level.”

It further elaborates that “the PforR modality will structure a clear set of incentives by linking disbursements to specific milestones. At the state level the rewards will come from the implementation of an agreed set of policy reforms. At the city level, the incentives will come in the form of untied performance grants. These grants will be expended on urban infrastructure and service-delivery but will be structured in a way that will incentivize cities to assume the additional functions and responsibilities that would come from the implementation of the state-level devolution reforms”.

The proposed operation will follow “the Multiphase Programmatic Approach (MPA), approved by the Bank Board of Directors on July 2017. An MPA allows the structuring of a long and

³⁰<http://projects.worldbank.org/P164940?lang=en>

complex engagement as a set of smaller linked operations (or phases) under one Program agreed during the initial program design. The Program would focus on: (i) deepening the implementation of selected reforms at the sub-national level by identifying stretch targets (that go beyond the usual check-list approach); (ii) provide stronger financial incentives to undertake these reforms; and (iii) provide in depth technical assistance for institutional systems development and demand-driven capacity building”.

Further, “By adopting this approach, the Program seeks to test the hypothesis in a limited number of states and cities that a reform linked performance incentive mechanism can provide financial resources to the ULBs in a way that encourages states and ULBs to complete the process of devolution and strengthen their systems and capacities to improve service delivery”.

About the implementation steps under the project the document notes: “A detailed activity mapping for each of the functions would be required. The states would be required to devolve revenue raising powers and financial approval powers through appropriate legal instruments that would empower the Mayors and enable the ULBs to take their own decisions with respect to deploying the financial resources for local priorities and levy taxes and user charges to ensure at least cost recovery during the operations phase.”

It adds, “The reform activities to strengthen the core functions including own source revenue generation; improving the organizational structures and human resource capacities; strengthening the planning and implementation capacities for service delivery; and establishing mechanisms for citizen participation. By strengthening the ULBs governance, accountability and financial management systems, the Program seeks to address the barriers that restrain private sector participation in the urban sector including limited ULB finances, lack of transparency, and weak governance systems.”

The Bank’s Urban Reforms Program (AMRUT Plus) can be seen in synchronization with the Country Partnership Strategy and the Systematic Country Diagnostic being developed for India.

A draft of the ‘World Bank Group Country Partnership Framework for India (FY18-22)³¹: Supporting India’s Transformation’ has been posted on the Bank’s website for public comments. As part of the framework it notes that “the Country Partnership Framework (CPF) will carry through on lessons learned from preceding country partnership strategy” and “delivery of development results depends more on the length and depth of WBG engagement than the amount of financing”.

³¹ <https://www.worldbank.org/en/news/feature/2018/05/21/world-bank-group-draft-country-partnership-framework-india-fy18-22>

It notes that the Systematic Country Diagnostic (SCD) conducted by the Bank identifies priorities such as:

- Enhancing productivity and livability of cities
- Changing policies for agri. and wider rural economy
- Reforms and correcting distortions in energy, water, land
- Creating a climate for growth: infrastructure, finance, firms
- Administrative reforms for a more effective State

The CPF framework gives the focus areas and objectives where the WBG will seek results as:

- Improve living conditions and sustainability of cities
- Increase access to sustainable energy
- Improve disaster risk management and resilience to climate change
- Increase the resilience of the financial sector and financial inclusion
- Improve connectivity and logistics
- Increase access to improved water supply and sanitation

The WBG will systematically apply four key approaches to improve implementation:

- Leveraging private finance: increasing focus on facilitating private sector solutions to development challenges.
- Engaging with a federal India
- Strengthening public sector institutions
- Supporting a Lighthouse India

As part of leveraging private finance, increasing focus on facilitating private sector solutions to development challenges. It includes steps such as:

- Infrastructure Sector assessment to identify gaps and reforms to facilitate private investments
- Improving the ecosystem for leveraging private finance for -
- Advisory and lending support for PPP transactions
- Partnership with domestic financial institutions such as the National Infrastructure Investment Fund and associated credit enhancement facility

Applying a ‘Cascade’ approach to maximize finance for development through promoting where appropriate private sector solutions to address development needs such as in energy, transport, logistics, urban development sectors offer potential for cascade approach.

The World Development Report³² of 2016 included a section on smart cities describing the smart city concept. It says that –“a smart city”– is a city that leverages the latest in technology

³² [http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-
Replacement-PUBLIC.pdf](http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf)

and connectivity to make better decisions and achieve the urban aspirations of its residents. Specifically, smart cities collect lots of data through *instrumentation*, bring these data together through *integration*, and then analyze the integrated data for *intelligence* on how to improve the city's services and quality of life".

The report recognizes that, "Despite widespread enthusiasm, however, discussions held under the World Bank's Urbanization Knowledge Partnership indicate that most city leaders struggle to understand how to best invest in intelligent infrastructure and connectivity to deliver long-term value. In addition, the concept of a smart city has grown somewhat controversial. Proponents argue that smart city innovations offer a genuine revolution in city management. Skeptics see empty hype that risks wastefully distorting the investments of resource-constrained governments as they prioritize 'fancy' technology over less exciting but more important foundational investments."

The report elaborates: "Most smart city innovations have their origins in the private sector. Engineers argue that a city is essentially a complex system of systems, and each of these systems generates data that can be analyzed to make cities smarter. But, for individual 'smart systems' to add up to a 'smart city', innovations must be on a citywide scale. That requires contributions and ideas not just from commercial firms but also from governments and citizens through **public-private-people partnerships.**"

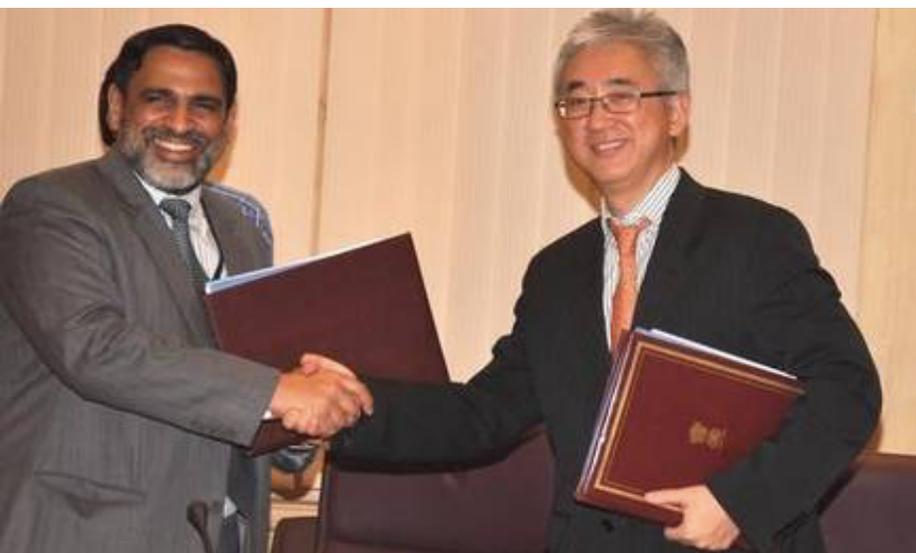
The Bank's interest in smart cities program across the world can also be seen from its report – Planning, Connecting and Financing Cities – Now³³ – released during a workshop organized on 'Smart Cities for All', in March 2012 in Washington DC. It states that "the government can establish its credit worthiness by first securing cash flows from user fees and taxes—and by leveraging the value of land in several ways, including taxes. Only after that can the government begin to borrow money and attract private investment, making finance easier".

"...There are at least two situations in which private financing may be the preferred course: when the government sees public-private partnerships as a way to improve efficiency in service provision, and when the government suffers from severe credit constraints that prevent it from obtaining credit for improvements to publicly run systems..."

³³ <https://openknowledge.worldbank.org/handle/10986/12238>

The World Bank projects that extend support to smart cities in India

Sr. No.	Project Name	Project ID	Amount USD	Status
1.	Uttarakhand Water Supply Program for Peri Urban Areas	P158146	120	Active
2.	Uttar Pradesh Pro-Poor Tourism Development Project	P146936	40	Active
3.	Andhra Pradesh 24X7 Power for All	P155038	240	Active
4.	Madhya Pradesh Urban Development Project	P155303	116	Active
5.	Karnataka Urban Water Supply Modernization Project	P130544	100	Active
6.	Tamil Nadu Sustainable Urban Development Program	P150395	400	Active
7.	Andhra Pradesh And Telangana Municipal Development Project	P071250	300	Active
8.	Jharkhand Municipal Development Project	P158502	210	Pipeline
9.	India Urban Reforms Program (AMRUT Plus)	P164940	500.00	Pipeline
10.	Mumbai Urban Transport Project 3	P159782	500.00	Pipeline
11.	Amaravati Sustainable Capital City Development Project	P159808	300.00	Pipeline
12.	Shimla Water Supply and Sewerage Project	P160862	85.00	Pipeline



Mr Venu Rajamony, Joint Secretary, Department of Economic Affairs Ministry of Finance exchanging documents with Mr Hun Kim, Country Director, ADB after signing US\$ 250 Million loan agreement for second India infrastructure project financing facility, Tranche-11. Photo credit: Business Line

Asian Development Bank

ADB has proposed to invest US \$500 million in smart cities through its proposed project called Smart Cities Infrastructure Investment Program. It is also investing in smart cities through a project named Strengthening Climate Change Resilience in Urban India. Additionally,

there are ADB projects that are also providing support to PPPs in infrastructure development.

The Project Data Sheet (PDS) of the Smart Cities Infrastructure Investment Program (Facility Concept)³⁴ states: “The proposed multi-tranche financing facility (MFF) namely Infrastructure Investment Facility for Smart Cities in India (the facility) involves sovereign loans of \$500 million in local currency through India Infrastructure Financing Company (IIFCL), a financial intermediary, to support implementation of the Smart Cities Mission across Indian states. The objective of this facility is to enhance access to finance smart urban infrastructure while **leveraging commercial capital for sustainable urban infrastructure improvement**”.

It further states that this program would be supported by “a sub-project under cluster technical assistance (C-TA) 0019-IND: Strengthening Climate Change Resilience in Urban India. The CTA is financed on a grant basis by the Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility”.

The program description says: “Integrated and effective urban development is needed to provide sustainable and affordable basic services. There is an enormous potential to scale up good practices in urban planning and infrastructure development, improve behaviors in hygiene and sanitation, and strengthen institutions to improve living standards for all urban residents. This requires comprehensive development of physical, institutional, social and economic infrastructure, which is important in improving the quality of life and attracting people and investments to the cities, setting in motion a virtuous cycle of growth and development. The Government of India's (GOI's) national flagship program of Smart Cities Mission is a step in this direction. In the approach to the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of smart solutions.”

It further elaborates: “The Government of India will support about 100 smart cities over five years, which will act as a lighthouse for other aspiring cities. The implementation of the Smart Cities Mission at the city level will be done by a special purpose vehicle (SPV) created for each smart city. The SPV will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects. The States/Urban Local Bodies (ULBs) shall ensure that, (a) a dedicated and substantial revenue stream is made available to the SPV so as to make it self-sustainable and could evolve its own credit worthiness for raising additional resources from the market and (b) Government contribution for Smart City is used only to create infrastructure that has public benefit outcomes.”

³⁴<https://www.adb.org/projects/50310-001/main>

ADB's project Supporting Public-Private Partnerships for Infrastructure Development³⁵ brings out its objectives as: "the TA will (i) provide focused support to selected states and central line ministries with emphasis on delivery of projects through PPP experts; (ii) assist at the central level, DEA PPP cell, to continue to play its crucial role of structuring and appraising new PPP projects, and supporting a PPP enabling environment; (iii) help DEA support transitioning to 3P India (a proposed institution with the necessary expertise for supporting PPPs), which would be a sustainable model for providing long-term support for PPPs".

It adds, "...the Asian Development Bank (ADB) has been assisting the Government of India's (GoI) public-private partnership (PPP) program to meet the country's large infrastructure needs. The GoI-ADB initiative in mainstreaming of PPPs has been an evolving and structured step-wise approach, supported through a series of TA projects designed to mainstream PPPs in the country. Following a joint review by the GoI and ADB of first phase of ADB support to the GoI for mainstreaming PPPs, the GoI requested ADB for anew TA to further the PPP agenda..."

The ADB Country Partnership Strategy³⁶ (2018 – 2022) - Accelerating Inclusive Economic Transformation -- notes that "the Country Partnership Strategy (CPS) will be driven by front-end strategic studies that will identify high-priority transformative investments, and associated policy advice. ADB will adopt a synergic approach beyond sector and thematic boundaries to address multi-dimensional development challenges, such as supporting municipal reforms to leverage private investments in urban infrastructure".

"...The CPS 2018–2022 will focus on three pillars. Pillar 1 will boost economic competitiveness to create more and better jobs by expanding infrastructure networks for transport and energy along economic corridors, enhancing management of corridor development and urban centers, and addressing the skills gap to support industrialization. Pillar 2 will provide inclusive access to infrastructure networks and social services by improving the infrastructure bottlenecks in lagging regions, providing better municipal services for the urban poor and supporting investments in rural infrastructure to improve agricultural productivity and reduce the growing rural-urban income gap. Efficient public sector management will be supported to create fiscal space for investments in inclusive growth for social and rural development. Pillar 3 will address environmental degradation through mitigating the negative impacts of climate change and promoting sustainable natural resource use in the project design..."

³⁵<https://www.adb.org/projects/48230-001/main>

³⁶<https://www.adb.org/sites/default/files/institutional-document/363331/cps-ind-2018-2022.pdf>

Pillar 1: Boosting economic competitiveness to create more and better jobs.

To fully utilize the potential of the economic corridors, a three-pronged approach will be taken:

(i) build trunk infrastructure and competitive cities in the economic corridors, (ii) improve the investment climate for industrial development, and (iii) boost the employability and productivity of the growing workforce.

Economic corridors with trunk infrastructure and competitive cities.

ADB will continue to support strategic planning studies to develop economic corridors and coastal economic zones, such as the East Coast Economic Corridor, in order to drive India's economic transformation. In line with the strategic plans, ADB will support investments to make Indian cities, their clusters, and the industrial nodes competitive, well-connected, and capable of providing a clean livable environment. This will entail building trunk infrastructure—such as railways, expressways, ports and logistics facilities—to connect the industrial nodes with national and global value chains, high-voltage electric power transmission systems, and smart distribution systems. These will support the government's Make in India initiative and Sagarmala project, as well as the Act East and National Manufacturing policies. Urban investments will focus on vitalizing the government's Smart Cities initiative. ADB will support long-term urban development planning and basic urban infrastructure investments, including for multimodal public transport facilities and smart transport management. Since the corridors cover multiple states, ADB will explore assisting large-scale infrastructure investments through clusters of sector investments in larger areas and/or multi-sector projects on specific cities and clusters, in a sequential manner.

Improved investment climate.

ADB will provide policy and strategic advice, and assist with the implementation of measures to develop the industrial clusters particularly in the corridors. The aim is to ensure that the planned large infrastructure pays off and attracts businesses and industries. The assistance will cover (i) capacity building of the institutions for corridor management; (ii) measures to continue improving the ease of doing business, such as e-business and unified online portals; and (iii) industrial and sector policy strengthening. Assistance to major municipalities will strengthen their capacity to realize the full potential of revenue mobilization through sound land use planning and improved municipal tax systems. The aim is to enhance the bankability of municipal sector projects, thereby reducing and eventually replacing direct public sector project finance with financial intermediation.

Pillar 2: Inclusive provision of infrastructure networks and services.

Inclusive urbanization.

ADB's urban sector program will contribute to inclusive growth by assisting low-income states and supporting investments in municipal infrastructure (water supply, sanitation, solid waste management, urban transport and traffic management, tourism infrastructure, and urban health

services). ADB support will help India achieve the SDGs to enhance the coverage, quality, and continuity of basic services. It is aligned with the government's three flagship urban programs: Smart Cities Mission, AMRUT, and Swachh Bharat Mission. Combined support will be provided to (i) promote municipal reforms and improve governance, including adopting e-governance systems; (ii) build the capacity of ULBs in project implementation and utility service delivery; and (iii) develop financial intermediaries in states.

ADB programs will also adopt innovations, such as uninterrupted pressurized water supply, smart metering and operation to reduce nonrevenue water, fecal sludge management, wastewater reuse and recycling, and waste-to-energy initiatives. Targeted poverty reduction (such as in urban slums) and GESI mainstreaming components will support inclusiveness. Agendas such as affordable housing and slum development will be explored as private sector operations. ADB will also reinforce government efforts to develop health systems in urban areas that can deliver quality health services and reach the urban poor and vulnerable”.

As part of the cross-cutting theme of private sector development, the CPS states: “ADB will continue prioritizing private sector development and private participation in infrastructure investments. ADB’s public and private sector departments will closely collaborate. While the operations of the Private Sector Operations Department (PSOD) are dynamic and driven by private demand, ADB support for front-end strategic studies (such as on the East Coast Economic Corridor) will provide platforms for identifying and assisting in implementing priority investments and related policy advice in a synergic manner. ADB’s private sector operations will support the three strategic priorities of the CPS, explore more innovative and inclusive infrastructure, and catalyze the development of the finance sector. ADB will consider support for transport (ports, airports, roads, railways, and logistics), power (including clean and renewable energy), urban infrastructure (including sewerage and solid waste management), affordable housing, financial inclusion, agriculture (including agribusiness and irrigation), manufacturing, health, and education. Transactions from low-income states will be prioritized, including funding financial institutions for onlending to increase women’s access to finance.”

It further emphasizes: “ADB will also support the government’s priority to revive and enhance private financing of infrastructure projects, including PPPs. ADB will continue its long-term partnership to strengthen the PPP policy and institutional framework and PPP capacity, such as establishing a dedicated PPP institute, strengthening state-level PPP setups and appraisal systems, and supporting the development of tools and instruments to bolster PPP operations. ADB’s sovereign operations will also support extending PPPs by enhancing the bankability of infrastructure projects, particularly in the energy and urban sectors, to attract private financing (para. 28). New contractual modalities, such as annuity and long-term operation and maintenance contracts, will also be explored.”

Some of the other ADB projects that extend support to the smart cities initiative are:

Sr. No.	Name of Project	Amount (US\$)	Description
1.	Advanced Project Preparedness for Poverty Reduction - Capacity Development of Institutions in the Urban Sector in Rajasthan	2,25,000	(i) establish sustainable corporatized state-level organization for urban development; (ii) establish independent corporatized utilities at the city level to manage water supply and wastewater services, and promote public-private partnerships (PPPs) in the urban water and wastewater sectors; (iii) delegate water supply operations from the state to the municipal bodies; (iv) rationalize urban property tax in the state; (v) develop a long-term urban development policy; (vi) develop a human resource development plan for urban governance; (vii) improve revenue realization from water and sewerage charges; (viii) improve water supply and wastewater service delivery in the state; and (ix) establish benchmarking of urban services in the state.
2.	Assam Urban Infrastructure Investment Program	51 m	(i) provide improved and sustainable urban services at the standards set by the Government in the cities of Guwahati and Dibrugarh in Assam through the delivery of improved water supply, solid waste management (SWM), and drainage infrastructure.
3.	Bangalore Cluster City Development Investment Program	300 m	(i) improve regional and metropolitan planning, (ii) upgrade key economic and social infrastructure, and (iii) enhance urban governance (including service delivery) to create a better business and investment climate. The Program proposes to achieve the above objectives by: (i) ensuring that multi-stakeholder demand-based (cluster) infrastructure development is preceded by metropolitan economic and sector planning, (ii) promoting sectoral coordination and convergence, and (iii) establishing a strong partnership between public and private sectors.
4.	National Investment and Infrastructure Fund Limited	1.5 m (TA)	i. formulate and refine NIIF's investment strategy based on the financing gaps and market needs, including identifying the various sub-funds to be established; ii. identify a pipeline of viable and executable investment opportunities across India with credible sponsors for the various sub-funds; iii. assist in identifying potential investors in NIIF and/or its sub-funds.
5.	North Eastern Region Capital Cities Development Investment Program	200 m	Part A: Improved urban infrastructure and services Expanded and rehabilitated water supply systems, Sewage collection, management, and treatment, and improved sanitation, Solid waste management systems Part B: Strengthened institutional development and investment program management Urban institutional, financial, and service delivery reforms and strengthened municipal capacity, Improved public utility

			management, Increased public awareness, Investment program capacity in Aizawl, Gangtok, and Kohima.
6.	Promoting Smart Drinking Water Management in South Asian Cities	1.25 m	(i) develop operational efficiency improvement plan, (ii) implement training programs on smart drinking water management including the latest ICT-based operational technology, (iii) prepare financial sustainability improvement plan, (iv) introduce new drinking water service contract modalities, and (v) organize study visits and workshops.
7.	Promoting Urban Climate Change Resilience in Selected Asian Cities	15 m	(i) urban system and climate risk analysis, (ii) integrated urban infrastructure planning and management, (iii) pro-poor urban development, and (iv) urban climate change resilience improvement.
8.	State-Level Support for National Flagship Urban Programs	1.87 m	preparing the investment program and conducting technical, economic, financial, governance, safeguards, gender and social due diligence for the ensuing multi-tranche financing facility (MFF).
9.	Strengthening Climate Change Resilience in Urban India - Strengthening Smart Water Management and Urban Climate Change Resilience in Tamil Nadu	1.5 m	(i) conduct an advanced basin-wide study of water-related disaster risks considering climate change in Greater Chennai City Corporation and other selected towns in Tamil Nadu, resulting in strategic and actionable recommendations to strengthen urban water management (drinking water supply, sewage collection, wastewater treatment, drainage, and water security) and flood early warning systems; and (ii) provide technical support to the Government of Tamil Nadu in the implementation of its recently launched Sustainable Water Security Mission, including identification of smart, innovative and sustainable water management projects, and support for institutional and capacity strengthening measures, some of which can be considered under an ADB investment program.
10.	Strengthening Climate Change Resilience in Urban India - Supporting Climate Change-Resilient Smart Cities Mission Projects	2.5 m	(i) conduct advanced climate risk and vulnerability assessments, resulting in integrated climate change-resilient urban plans, and strategic and actionable recommendations to strengthen urban climate change resilience of urban infrastructure and services (drinking water supply, sewage collection, wastewater treatment, drainage, sustainable urban transport, energy efficiency, etc.); and (ii) provide technical support to select state government agencies and cities in the implementation of the national urban flagship programs, including identification of smart, innovative and sustainable urban management projects, and support for institutional and capacity strengthening measures, including facilitation of PPPs, some of which would be considered under an ADB investment program and/or financing through a line of credit being established by ADB with one of the financial intermediaries.
11.	Supporting	1.5 m	(i) provide focused support to selected states and central line

	PPPs for Infra Development		ministries with emphasis on delivery of projects through PPP experts; (ii) assist at the central level, DEA PPP cell, to continue to play its crucial role of structuring and appraising new PPP projects, and supporting a PPP enabling environment; (iii) help DEA support transitioning to 3P India (a proposed institution with the necessary expertise for supporting PPPs), which would be a sustainable model for providing long-term support for PPPs.
12.	Supporting Rajasthan's Productive Clusters in the Delhi-Mumbai Industrial Corridor	1 m	Support industrial cluster development in Rajasthan around Delhi-Mumbai Industrial Corridor and in and around cities. Supporting the government's vision of inclusive and sustainable growth is job creation and access to jobs through investments in infrastructure, logistics, urban services, and skills to support manufacturing and services, and the creation of supply chain networks along economic corridors as well as in urban centers. To create synergies through the development of the economic corridors.
13.	Tamil Nadu Infrastructure Fund Management Company Limited	1.5 m	<p>i. formulate and refine TNIF's investment strategy based on the financing gaps and market needs;</p> <p>ii. identify a pipeline of potential bankable and executable infrastructure-related investment opportunities;</p> <p>iii. mobilize third-party institutional capital for the fund to be able to reach its target capitalization; and</p> <p>iv. assist in the ongoing development and implementation of the Tamil Nadu Energy Promotion Scheme (TNEPS) in coordination with TEDA.</p>
14.	Tamil Nadu Urban Flagship Investment Program	500 m	Develop priority water supply, sewerage, and drainage infrastructure in at least 10 cities located within strategic industrial corridors of Tamil Nadu. It will support innovative pilots, including India's first solar-powered sewage treatment plant (STP) to offset greenhouse gas emissions and enhance operational efficiency; strengthen urban governance; and build capacity of state and local institutions to enhance urban service delivery, environmental sustainability, and climate resilience.
15.	Smart Cities Infrastructure Investment Program (Facility Concept) (Proposed)	500 m	<p>Loan through India Infrastructure Financing Company (IIFCL), a financial intermediary, to support implementation of Smart Cities Mission across Indian States.</p> <p>To enhance access to finance smart urban infrastructure while leveraging commercial capital for sustainable urban infrastructure improvement.</p> <p>Resources to undertake adequate infrastructure investment financing and structuring, and prepare bankable projects; and Institutional capacity to effectively manage the programming and prioritization of these strategic investments.</p>

International Finance Corporation (IFC)

IFC, a sister organization of the World Bank and member of the World Bank Group, is the largest global development institution focused exclusively on the private sector in developing countries³⁷.

IFC states that it is uniquely positioned to help mayors and municipal leaders meet these demands. Through the Cities Initiative it has forged strategic partnerships with cities around the world to take a holistic view of needs and offer solutions in urban transportation, water and waste management, street lighting, affordable housing, energy efficiency, and climate resilience.



IFC can mobilize commercial financing for priority projects, connect cities with capital markets, and help improve credit-worthiness through financial management training³⁸.

IFC is also a member of the Smart Cities

Dr. Harsh Vardhan, then Minister of Environment and Forests, addressing IFC's Climate Business Forum 2017 in Delhi. He said technology and finance are the key for countries like India that can simultaneously address climate change and development needs. Source: Dr Harsh Vardhan

Council³⁹ and is actively participating in India's Smart Cities Mission through providing advisory services as well as investments in equity participation and project financing.

Some of the recent analysis presented by IFC makes an attempt to link climate change with investments in cities in climate smart technologies.

IFC, held 2017 Climate Business Forum in New Delhi, India. The event looked to provide innovation in technology, entrepreneurship, and private sector sustainability approaches in

³⁷https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/about+ifc_new

³⁸https://www.ifc.org/wps/wcm/connect/Industry_EXT_Content/IFC_External_Corporate_Site/Infrastructure/Priorities/Cities?WCM_PI=1&WCM_Page.348821804b00b3a18827b9b94e6f4d75=2

³⁹<https://smartcitiescouncil.com/members/international-finance-corporation>

multiple industries, including climate-smart agriculture, smart cities, green finance, renewable energy and energy storage, and green buildings⁴⁰.

Some of the recent analysis presented by IFC makes an attempt to link climate change with investments in cities in climate smart technologies. Some of the recent initiatives launched by IFC are climate change focused and are aligned with Smart Cities Mission of the Government of India.

A recent IFC, analysis released in 2018 – *Climate Investment Opportunities in Cities* – links city level policy decisions and actions to mitigate climate change with opening of new investment avenues to take a green, climate-friendly approach to urbanization and investments in green transport, buildings, and other low-carbon and resilient infrastructure.

In the backdrop of Paris Agreement, limiting global warming and building urban climate resilience it says that “cities cannot achieve their climate ambitions alone and must collaborate with all stakeholders, including business and investors. City governments play a key role in creating enabling conditions to attract private investment to reduce emissions, manage risks, and build climate resilience. The private sector can play a central role in supporting cities through a combination of innovation, know-how, financing and new service delivery models, and there is growing interest from the private sector to invest in **climate-smart cities**”.

Further elaborating the approaches for to finance climate-smart investments in cities, it says that to build urban resilience strategies and achieving mitigation targets, linking cities with finances would be essential. To make climate-smart investments, cities would rely on reallocation of existing budgets and the ability to raise revenue. It says that the investment barriers faced by cities, such as creditworthiness, bankability, and the lack of available project pipelines, limit what they can do on their own and pose an obstacle to attracting private finance.

Despite not so encouraging experiences with Public Private Partnerships (PPPs), it continues to pursue them as a primary mechanism to finance capital-intensive, sustainable infrastructure along with targeted taxes and incentives that can also be used to encourage investment in such infrastructure. It suggests that land value capture mechanisms can encourage green infrastructure development, while leveraging private finance as well as debt financing instruments such as **green bonds** could allow cities to acquire long-term debt at stable prices.

It notes that in addition to these traditional approaches, innovative financial mechanisms to bridge the gap between resilient infrastructure needs and financing such as resilience bonds and

⁴⁰https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/events/ifc+climate+business+forum+2017

climate insurance are already being piloted for the creditworthy metro cities. For the mid-level cities it says it will require sustained and disciplined attention to policies to support creditworthiness, and to establish solid and stable climate finance ecosystems and integrate climate considerations into development frameworks. It adds that innovative financial and collaborative approaches will be key to preparing bankable projects, developing domestic financial markets and mobilizing private financing for local investment.

The IFC analysis estimates that there is a cumulative climate investment opportunity of \$29.4 trillion across six urban sectors in emerging market cities to 2030. Majority of it is in green buildings (\$24.7 trillion), covering both new constructions and retrofits, improvements in low carbon mobility solutions, driven by public transport infrastructure and the expected surge in electric vehicles, account for \$1 trillion and \$1.6 trillion respectively. The availability and management of water resources is a consistent primary concern for cities, presenting a \$1 trillion opportunity in climate-smart water and waste water management and infrastructure.

A similar IFC analysis of *Climate Investment Opportunities in South Asia* estimates a \$3.4 trillion climate investment opportunity for South Asia in key sectors between 2018 and 2030, assuming that each country will fully meet its Nationally Determined Commitments⁴¹ (NDC) and relevant sectoral targets and policy objectives, as stated. This number exceeds the \$2.2 trillion investment potential estimate for South Asia included in the 2016 global Climate Investment Opportunities report, as more countries and new sectors such as electric vehicles are included in the analysis. For example, the estimate for India now includes electric vehicles, urban water and climate-smart agriculture, which were not covered in the 2016 analysis and represent a sizeable portion of this increase, along with increased renewable energy potential reflecting the scaled-up energy access targets.

The current investment estimates include sectors like – renewable energy, large hydro, green buildings, transport infrastructure, transport electric vehicles, municipal solid waste, climate smart urban water and climate smart agriculture.

The report states that while the Nationally Determined Commitments (NDCs) are an essential building block to signaling a market for climate investments, they need to be supplemented by a comprehensive approach to create markets for climate business across these sectors.

It further says that this opportunity cannot be achieved by the public sector alone. A strong and engaged private sector is often better placed to implement and execute projects; what they need is a market opportunity and a risk adjusted return. While the NDCs⁴² identify potential markets

⁴¹ For a list of all nationally determined contributions, see: http://unfccc.int/focus/indc_portal/items/8766.php

⁴² The World Bank NDC Platform - indc.worldbank.org

for climate investments, a comprehensive approach to creating markets for climate business is needed across these sectors. This involves establishing regulatory and policy frameworks; promoting competition and innovation; achieving demonstration effects that encourage replication, and building capacity and skills to open new markets.

It makes clear that to unlock private investments bankable projects and an attractive investment climate are needed. PPPs, the identification and appropriate allocation of risks to lower costs, and the enabling and mobilizing of finance will also be necessary. Creating these conditions will require strong political leadership and continued, consistent and clear signals to provide certainty to companies and investors. IFC stands ready to work with partners across the region to build on the progress to date to further unlock investment and support South Asian countries as they work to achieve their objectives.

Another IFC report named *Climate Investment Opportunities Report – Creating Markets for Climate Business* – provides the following table giving the description of the climate-smart urban water infrastructure sector market snapshot and growth forecast, along with a set of proven policies and regulations, financial innovations, and business models.

Sector	Market snapshot	Highest growth markets	Key actions to attract private investment
Climate-Smart Water Infrastructure	<ul style="list-style-type: none"> • More governments are looking to the private sector for climate-friendly water supply and treatment investment • In 2015, private sector water investment totaled \$5.3 billion • More than 100 countries mention the water sector in their NDCs 	<ul style="list-style-type: none"> • Investment for water supply and sanitation could exceed \$13 trillion by 2030, with \$8 trillion needed in the Asia-Pacific region alone • The global market for water recycling technologies is \$23 billion, and rapid growth will continue 	<p>Step 1: Establish water access, cost recovery and service quality goals, increase inter-government coordination and foster water-smart public awareness.</p> <p>Step 2: Ensure financial sustainability by implementing water pricing and removing subsidies.</p> <p>Step 3: Make public-private cooperation deliver increased water efficiency via guarantees, PPPs, project preparation funds and performance-based contracting.</p> <p>Step 4: Build capacity through training, regional cooperation, public awareness, home/equipment certification, auditing and benchmarking.</p>

The sector wise investments estimated by the IFC in Climate Investment Opportunities in South Asia Fact Sheet by 2030 totaling to around \$ 3.1 trillion –

- Renewable Energy - \$ 448 b
- Transport Infrastructure - \$ 250 b
- Green Buildings - \$ 1.4 t
- Electric Vehicles - \$ 667 b
- Climate Smart Agriculture - \$ 194 b
- Municipal Solid Waste Management – \$ 11 b
- Climate Smart Urban Water - \$ 128 b

In April 2017, IFC partnered with asset management company, Amundi, to launch the world's largest green-bond fund dedicated to emerging markets—a \$2 billion initiative aimed at unlocking private funding for climate-related projects.

IFC, one of the earliest issuers of green bonds, launched a green bond program in 2010 to catalyze the market and unlock investment for private sector projects that support renewable energy and energy efficiency. As on 30 June, 2017, IFC had issued \$5.8 billion in green bonds in twelve currencies.

IFC's *Strategy and Business Outlook Update FY19 – FY 21*, elaborates that for green bonds the most recent mobilization platform is the Green Cornerstone Bond Fund (GCBF). It is the world's largest green-bond fund dedicated to emerging markets, creating a vehicle for channeling investment from global institutional investors to climate-smart bank financing in the developing world. Created in partnership with asset management company, Amundi, GCBF represents a novel approach that simultaneously creates supply (through investment support), and demand (through the fund) for bond financing. Both are essential in achieving the goal of creating a new market that will accelerate and expand climate finance in the developing world. The investment support creates supply by strengthening the capacity of developing country financial institutions to issue green bonds, provide information disclosure to investors, and support the development of debt capital markets. The combination of the fund and the investment support helps to attract large institutional investors who might otherwise not participate in higher-risk markets.

IFC's *Green Bond Impact Report, Financial Year 2016* notes that the Paris Agreement is a major turning point for the global climate change agenda, laying a green path for greater opportunities for the private sector. Aligned with COP21 agenda, IFC is in an unprecedented position to help its private sector clients capture opportunities through investments, innovative financing, and advisory work to address regulatory and policy obstacles to green growth.

The Green Bond Impact Report for FY 2016 indicates several private sector projects in solar and wind farm renewable energy, constructing green residential buildings as well as scaling-up investments (local and international) by a financial intermediary in renewable energy projects.

It states that throughout FY16, IFC continued its leadership role in developing the Green Bond market as an active member of the Executive Committee (EXCOM) for the Green Bond Principles (GBP).

IFC has also been a key member of the G20 Green Finance Study Group (GFSG) set up in January 2016, tasked with the mandate to “identify institutional and market barriers to green finance, and based on country experiences, develop options on how to enhance the ability of the financial system to mobilize private capital for green investment”.

Emerging from the GFSG’s work are a number of options for the G20 country authorities to consider for voluntary adoption to enhance the ability of the financial system to mobilize private capital for green investment. In September 2016, at the G20 Summit in Hangzhou, China, global leaders endorsed a set of recommendations to boost green finance and called on the IFC-supported Sustainable Banking Network (SBN) and other partners to help lead the implementation. This marks the recognition of the central role the financial sector plays in reducing climate change and advancing environmentally sustainable growth. Formed in 2012, SBN brings together central banks, regulators and trade associations from across emerging markets that seek to transform domestic financial systems to advance national goals on climate change and sustainable growth.

IFC Investments and Projects in India:

- Some of the investments made by IFC in India along with the private companies: Jain Irrigation Systems Limited, Azure Clean Energy Private Limited, Hero Future Energies Private Limited, Tata Cleantech Private Limited, Rewa Ultra Mega Solar Park and Punjab National Bank Housing Finance Limited.
- IFC is also collaborating with municipal corporations of Bhubaneswar and Thane. In Bhubaneswar, the project looks to develop a sustainable model for e-waste management in the city with the goal of establishing a first-of-its-kind collaboration between the local government entities, including BMC, State Pollution Control Board, IT Department and the private sector to address e-waste management challenges. The Clean e-Bhubaneswar Project is a part of the IFC-European Union Eco-Cities program. The Eco-Cities India is a multi-year climate-change focused program aligned with Government of India’s Smart Cities initiative as it is structured around designated ‘Smart Cities’ – Bhubaneswar, Bengaluru, Chennai, Mumbai and Pune.
- The long-term objective is to help India meet its nationally determined contributions (NDCs) by reducing greenhouse gas emissions and mobilizing private sector finance through a combination of established and innovative interventions designed for the

Indian market. The implementation of the project is being undertaken by the consortium of Sofies Sustainability Leaders Pvt. Ltd. and city-based Siddha Development Research and Consultancy⁴³.

- In Thane, Mahindra & Mahindra (M&M), has signed a Memorandum of Understanding (MoU) with the Thane Municipal Corporation (TMC) to provide end-to-end last mile mobility solutions. This would be done through the deployment of Mahindra's electric vehicles for first and last mile connectivity across Thane. In the initial phase of the project, Mahindra would deploy 100 electric vehicles and the partnership would be active for a period of 5 years. The project is supported by the Eco-Cities Program of the International Finance Corporation (IFC).⁴⁴
- IFC has also provided advisory to cities of Bhubaneswar, Jaipur, Berhampur, Cuttack, Rourkela, and Sambalpur improve their street lights through PPPs⁴⁵. In Bhubaneswar⁴⁶ and Jaipur⁴⁷ the PPP project was implemented with support from DevCo⁴⁸, a multi-donor facility affiliated with the Private Infrastructure Development Group⁴⁹.
- Varanasi city leaders are now working with the private sector to help the city regain its splendour—and secure a sustainable future. The strategy includes an innovative public-private partnership (PPP) model designed by IFC to build and operate new sewage treatment plants and rehabilitate infrastructure. These plants—along with others are being developed in the Indian cities of Haridwar and Mathura. IFC stresses strategies that go beyond individual transactions. We create markets for private investment and other private solutions for urban infrastructure⁵⁰.
- In Gandhinagar, Gujarat, IFC was the lead transaction advisor for 5 MW solar rooftop public-private partnership (PPP) project. IFC recommended a 25-year build, own, operate (BOO) concession. Under the agreement, the winning bidders will place thousands of solar panels on rooftops throughout the city divided into two clusters,

⁴³<https://india.smartcitiescouncil.com/article/pundits-call-strategic-approach-make-bhubaneswar-e-waste-free>

⁴⁴<https://www.mahindra.com/news-room/press-release/mahindra-signs-mou-with-thane-municipal-corporation-to-provide-end-to-end-last-mile-mobility-solutions>

⁴⁵https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/cm-stories/street-lights-brighten-indian-cities

⁴⁶https://www.ifc.org/wps/wcm/connect/4445388a-b1c6-4eaa-a4f6-67beee0abbba/PPPStories_India_BhubaneswarStreetLighting.pdf?MOD=AJPERES

⁴⁷https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/a-partnership-brightens-residents-prospects-in-indian-cities

⁴⁸ DevCo is funded by the UK's Department for International Development (DFID), the Austrian Development Agency, the Dutch Ministry of Foreign Affairs, the Swedish International Development Agency, and IFC.

https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/ppp/partners/devco

⁴⁹<http://www.pidg.org/about-us>

⁵⁰https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/cities-attract-a-better-future-with-private-investment-and-innovation

each with 2.5 MW of installed capacity. Most of these will be on public buildings, such as schools, hospitals, and offices. The remaining panels will be placed on private residences, which will receive rental income for hosting the panels. The developers will then connect power generated by the panels to the city grid. The government of Gujarat will provide access to roofs of buildings it owns, facilitate purchasing agreements with the power procurer for the electricity generated, and guarantee a subsidy if required. Azure Power and SunEdison each won one of the two 2.5 MW projects⁵¹.

Asian Infrastructure Investment Bank

AIIB is a multilateral development bank with a mission to improve social and economic outcomes in Asia. It is headquartered in Beijing, and has started operations in January 2016 and has now grown to 93 approved members worldwide⁵².

AIIB's Sustainable Cities Strategy released in August 2018 states that AIIB views infrastructure investments in cities to be distinctive from sectoral infrastructure investments, as they are often multi-sectoral in nature, require spatial integration, and have strong area impacts. These distinctive characteristics also create possibilities to utilize more innovative financing approaches, such as financing by land value capture, for infrastructure investments in cities.

As part of its Vision, Comparative Advantages and Guiding Principles it further states that its thematic priority is to mobilize private capital into infrastructure development which will enable the Bank to support urban public-private partnerships (PPP) and commercially-financed solutions.

The Bank will prioritize infrastructure investments in cities that are financially sound and viable. This will also support AIIB's thematic priority to mobilize more private capital into infrastructure development, including in cities. Notwithstanding this, to the extent that AIIB's financial sustainability is preserved, the Bank will maintain the flexibility to selectively support infrastructure investments in cities that do not initially offer sufficient financial returns to attract stand-alone private financing but present significant economic benefits.

Under its Implementation Approach and Priorities in cities, it states that AIIB will seek to invest in a selected group of cities with higher implementation capacity, particularly where there are established city master plans and where project sponsors have sound financial positions and robust governance.

⁵¹https://www.ifc.org/wps/wcm/connect/d0a75c804b077348b4acfe888d4159f8/PPPStories_India_GujaratSolar.pdf?MOD=AJPERES

⁵²<https://www.aiib.org/en/about-aiib/index.html>

As focus investment areas, AIIB will prioritize investments in three areas under this strategy. They are:

- (a) enhancing urban mobility;
- (b) improving basic infrastructure and city resilience; and
- (c) promoting integrated development.

It says that it will also support investments initiatives to adopt innovation and digitization to help improve economic, financial, environmental and social outcomes in cities, such as smart cities.

The financing instruments that the Bank looks to offer include variety of financing instruments, including government financing, private financing and PPPs. AIIB will widen its range of non-sovereign-backed financing instruments and develop scalability in its more innovative financing instruments, such as local currency financing, credit enhancements for municipal bonds and green finance.

AIIB's Strategy On Mobilizing Private Capital For Infrastructure, released in February, 2018 notes that the Bank's long- term aim is to position itself as a "go-to" institution for providing infrastructure financing solutions to client countries. Its vision includes:

- The Bank will be the champion and leading institution to catalyze private capital for infrastructure investment in the region;
- The Bank will work to develop emerging market infrastructure as an asset class.

A January 2019 AIIB release says: The Asian Infrastructure Investment Bank's (AIIB) Board of Directors has approved US \$500 million for a managed credit portfolio that aims to develop infrastructure as an asset class, develop debt capital markets for infrastructure and promote the integration of Environmental, Social and Governance (ESG) principles in fixed income investments in Emerging Asia. Focused on infrastructure-related bonds as an asset class, the AIIB Asia ESG Enhanced Credit Managed Portfolio will be comprised of corporate bonds issued by infrastructure-related issuers, including quasi-sovereign bonds and green bonds where proceeds are directed to sustainable infrastructure and other productive sectors⁵³.

AIIB's existing major infrastructure projects as well as smart cities, both, proposed and approved, include:

⁵³https://www.aiib.org/en/news-events/news/2019/20190109_001.html

AIIB Approved Projects:

Sr. No.	Project Name	Amount	Main Characteristics
1.	India: Bangalore Metro Rail Project – Line R6	\$ 335 m	The objective of the Project is to provide efficient and high – capacity north - south connectivity through the center of Bangalore by expanding the city’s metro system.
2.	Asia: IFC Emerging Asia Fund	\$ 150 m	IFC Emerging Asia Fund is being formed to provide investors with the opportunity to invest in IFC’s proprietary pipeline of investments in Emerging Asia. The Fund intends to make non-controlling equity, quasi-equity, and equity-related investments in companies, entities or other arrangements to build a diversified portfolio of investments across Emerging Asia. The objective of the Project is to facilitate private equity investments in companies, entities or other arrangements in Emerging Asia.
3.	India: Andhra Pradesh 24x7 – Power For All	\$ 160 m	Setting up power infrastructure for a Smart City. Smart Grid Development in Urban Areas - This component would support investments in smart grids and underground cables in selected cities as part of smart cities initiative promoted by GoI These investments would include smart meters on selected consumers, distribution SCADA, automated sub-stations, and ring main units.
4.	India: Transmission System Strengthening Project (Tamil Nadu)	\$ 100 m	
5.	India: India Infrastructure Fund	\$ 150 m	<ul style="list-style-type: none"> The North Haven India Infrastructure Fund aims to make private equity investments in the infrastructure sector in India and will capitalize on the strengths of Morgan Stanley, as the Fund manager. Project is to benefit mid-cap infrastructure projects in India by creating a mechanism to mobilize private capital from global long-term investors such as pension funds, endowments and insurance companies.
6.	India: Andhra Pradesh Urban Water Supply and Septage Management Improvement Project	\$ 400 m	The proposed project will include investments in water supply infrastructure which comprises of construction of intakes at raw water source, raw water transmission mains, water treatment plants, clear water transmission mains, treated water storages, distribution networks and household service connections in 50 ULBs in Andhra Pradesh. The project may also include investments in septage management and septage treatment plants including improvement of the drainage network to improve the sanitation services in the project ULBs.

7.	India: National Investment and Infrastructure Fund	\$ 200 m	<p>The Government therefore established the National Investment and Infrastructure Fund (NIIIF) to foster investment in the infrastructure sector in India. The Government of India will take a 49% stake in NIIIF, and aims to raise additional capital from long term investors, such as sovereign wealth funds, insurance and pension funds, endowments, and other private investors.</p> <p>The objective of the Fund is to mobilize more private sector capital into infrastructure sectors, and increase infrastructure investment in India. These investments will include operating companies and new ventures.</p> <p>Sector specific platform companies will be the primary investment vehicles of the Fund. For each sector of interest, the Fund will create a platform company in partnership with a limited number of financial investors.</p> <p>The Fund will exclusively invest in India and intends to operate mostly through scalable platform companies that will target infrastructure assets primarily in the following sectors: roads, ports, airports, power (generation, transmission, distribution), urban infrastructure, and logistics.</p>
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AIIB Proposed Projects:

Sr. No.	Project Name	Amount	Main Characteristics
1.	India: Mumbai Metro Line 4 Project	\$ 500 m	
2.	India: Amaravati Sustainable Capital City Development Project	\$ 200 m	<p>Project's design proposes three main components as follows:</p> <ol style="list-style-type: none"> 1. Basic urban and pro-poor infrastructure-Construction of major road infrastructure (65 km road length); and Upgrading of village infrastructure, including water, sewerage, village roads, connectivity to trunk infrastructure, etc. in the existing 29 villages within the capital area. 2. Green / Climate resilient urban investments <ul style="list-style-type: none"> - Flood mitigation for the 'Kondaveeti Vagu' water canal within the city area; and - Sewerage system and solid waste management system for Amaravati. 3. Technical assistance <ul style="list-style-type: none"> -Support for Project management; -Setting up key urban institutions, including the eventual city government of Amaravati; and -Introducing international good practice on city management

3.	AIIB Asia ESG Enhanced Credit Managed Portfolio	\$ 400 m	<ul style="list-style-type: none"> • Development of an Asia ESG Enhanced Credit Managed Portfolio of USD 500 million that comprises corporate bonds in Asian infrastructure and other productive sectors ; and • Launch of an ESG Markets Initiative in partnership with the appointed asset manager to catalyze ESG investing strategies and build capacity with market participants in Emerging Asia
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Concluding Remarks

The booklet brings out some of the trends and directions in international financing of the smart cities projects in India -

1. The budgetary allocations made by the government for its flagship program – smart cities mission – are quite low compared to the investments required for building such cities. Through convergence the mission looks to bring funds into smart cities mission from various other central as well as state government schemes.
2. In addition to the above several IFI projects as listed in the above sections are also converging into national, state and city wide smart city projects. The projects financed by IFIs which are linked with the smart cities projects are spread across all over from city level projects to state level as well as national level programs. These also include financing projects supporting financial intermediaries and also asset management funds.
3. These projects are not only bringing in the funds required but also policy recommendations to transform the urban infrastructure, governance and financial landscape.
4. There is continued stress to mobilise private capital and private sector to build and operate urban infrastructure, with a focus on infrastructure-related bonds as an asset class and to develop emerging market infrastructure as an asset class.
5. These finances look to prioritise infrastructure investments in cities that are financially sound and viable, support urban public-private partnerships (PPP) and commercially-financed solutions, cost recovery from delivery of public services, utilise more innovative financing approaches, such as financing by land value capture, for infrastructure investments in cities, as well as enhancing the ability of the financial system to mobilise private capital for green investment.
6. The current investment estimates include sectors like – renewable energy, large hydro, green buildings, transport infrastructure, transport electric vehicles, municipal solid waste, climate smart urban water and climate smart agriculture.

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7. The financing trends look to strengthen the formation of SPVs and the states/ ULBs to ensure a dedicated and substantial revenue stream is made available to the SPV so as to make it self-sustainable and could evolve its own credit worthiness for raising additional resources from the market.
 8. This involves establishing regulatory and policy frameworks; promoting competition and innovation; achieving demonstration effects that encourage replication, and building capacity and skills to open new markets. Suggesting that creating these conditions will require strong political leadership and continued, consistent and clear signals to provide certainty to companies and investors.
 9. Further promoting municipal reforms and improving governance, including adopting e-governance systems, build the capacity of ULBs in project implementation and utility service delivery and develop financial intermediaries in states.
 10. As part of the larger economic development plans the smart cities, industrial nodes/ clusters will be connected with national and global value chains and will entail building trunk infrastructure—such as railways, expressways, ports and logistics facilities.

Annexure – List of Smart Cities in India State-wise

The total number of 100 smart cities have been distributed among the States and UTs on the basis of an equitable criteria. The formula gives equal weightage (50:50) to urban population of the State/UT and the number of statutory towns in the State/UT.

Number of cities allocated to States based on urban population and number of statutory towns

State/ UT	No. of cities	Name of Cities
A & N Islands	1	1. Port Blair (Round Fast Track)
Andhra Pradesh	3	2. Vishakhapatnam (Round 1) 3. Kakinada (Round 1) 4. Tirupati (Round 2) 5. Amravati (Round 3)
Arunachal Pradesh	1	6. Pasighat (Round 3) 7. Itanagar (Round 4)
Assam	1	8. Guwahati (Round 1)
Bihar	3	9. Bhagalpur (Round Fast Track) 10. Patna (Round 3) 11. Mujaffarpur (Round 3) 12. Biharsharif (Round 4)
Chandigarh	1	13. Chandigarh (Round Fast Track)
Chhattisgarh	2	14. Raipur (Round Fast Track) 15. Naya Raipur (Round 3) 16. Bilaspur (Round 3)
Daman & Diu	1	17. Diu (Round 4)
Dadra & Nagar Haveli	1	18. Silvassa (Round 4)
Delhi	1	19. NDMC (Round 1)
Goa	1	20. Panaji (Round Fast Track)
Gujarat	6	21. Surat (Round 1) 22. Ahmedabad (Round 1) 23. Vadodara (Round 2) 24. Gandhinagar (Round 3) 25. Dahod (Round 3) 26. Rajkot (Round 3)
Haryana	2	27. Faridabad (Round Fast Track) 28. Karnal (Round 3)
Himachal Pradesh	1	29. Dharamshala (Round Fast Track) 30. Shimla (Round 3)
Jammu & Kashmir	1	31. Srinagar (Round 3) 32. Jammu (Round 3)
Jharkhand	1	33. Ranchi (Round Fast Track)
Karnataka	6	34. Davanagere (Round 1) 35. Belagavi (Round 1) 36. Mangaluru (Round 2) 37. Tumkuru (Round 2) 38. Shivamogga (Round 2) 39. Hubballi Dharwad (Round 2)

		40. Bengaluru (Round 3)
Kerala	1	41. Kochi (Round 1) 42. Thiruanathapuram (Round 3)
Lakshadweep	1	43. Kavaratti (Round 4)
Madhya Pradesh	7	44. Jabalpur (Round 1) 45. Indore (Round 1) 46. Bhopal (Round 1) 47. Ujjain (Round 2) 48. Gwalior (Round 2) 49. Sagar (Round 3) 50. Satna (Round 3)
Maharashtra	10	51. Pune (Round 1) 52. Solapur (Round 1) 53. Kalyan Dombivili (Round 2) 54. Nagpur (Round 2) 55. Thane (Round 2) 56. Nashik (Round 2) 57. Aurangabad (Round 2) 58. Pimpri Chinchwad (Round 3)
Manipur	1	59. Imphal (Round Fast Track)
Meghalaya	1	60. Shillong (Round 4)
Mizoram	1	61. Aizawl (Round 3)
Nagaland	1	62. Kohima (Round 2)
Odisha	2	63. Bhubaneswar (Round 1) 64. Rourkela (Round 2)
Puducherry	1	65. Puducherry (Round 3)
Punjab	3	66. Ludhiana (Round 1) 67. Amritsar (Round 2) 68. Jalandhar (Round 2)
Rajasthan	4	69. Jaipur (Round 1) 70. Udaipur (Round 1) 71. Kota (Round 2) 72. Ajmer (Round 2)
Sikkim	1	73. Namchi (Round 2) 74. Gangtok (Round 3)
Tamil Nadu	12	75. Coimbatore (Round 1) 76. Chennai (Round 1) 77. Vellore (Round 2) 78. Madurai (Round 2) 79. Thanjavur (Round 2) 80. Salem (Round 2) 81. Tiruppur (Round 3) 82. Tirunelveli (Round 3) 83. Thoothukudi (Round 3) 84. Tiruchirapalli (Round 3) 85. Erode (Round 4)
Telangana	2	86. Warrangal (Round Fast Track) 87. Karimnagar (Round 3)
Tripura	1	88. Agartala (Round Fast Track)
Uttar Pradesh	10	89. Lucknow (Round Fast Track) 90. Agra (Round 2) 91. Kanpur (Round 2) 92. Varanasi (Round 2)

		93. Jhansi (Round 3) 94. Allahabad (Round 3) 95. Aligarh (Round 3) 96. Bareilly (Round 4) 97. Moradabad (Round 4) 98. Saharanpur (Round 4)
Uttarakhand	1	99. Dehradun (Round 3)
West Bengal	4	100. New Town Kolkatta (Round Fast Track)

This booklet is a first in a series that looks to provide an overview of the smart cities at a conceptual level, smart cities mission in India, development of smart cities globally, the role of International Financial Institutions (IFIs) and bilateral agencies in promoting smart city projects in various cities across the world and India that includes digitalisation, infrastructure development and public services delivery by private corporations. It discusses the financing mechanisms proposed and implemented for delivering smart city projects, the overall costs involved in building a smart city, as well as the budgetary allocations for smart city projects in India in past four years.

Centre for Financial Accountability (CFA) engages in critical analysis, monitoring and critique of the role of financial institutions – national and international, and their impact on development, human rights and the environment, amongst other areas.

CFA partners with civil society groups, social movements and community groups in trying to ensure that financial institutions are transparent and accountable to the people.

We critically examine and monitor National Financial Institutions (both banking and non-banking), multilateral and bilateral institutions, export credit agencies and the new banks - Asian Infrastructure Investment Bank (AIIB) and New Development Bank (NDB).

Our work includes both research and programmes. We publish information resources and policy analysis. Our awareness programmes work towards demystifying finance through increasing public awareness and encouraging public debates about issues of financial accountability.