

Smart City Knowledge Mapping at WBG

Smart Cities Knowledge Silo Breaker

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Challenges cities face upon urbanization

Ranging across multiple industries and sectors

Buildings & Housing



Energy inefficiency
High building cost
Urban slums

Water & Waste Management



Facility inadequacy
Environmental challenges
Health challenges

Energy



Shortage of fuels
Usage inefficiency
Insufficient infrastructure
Financial weakness



Transportation



Traffic congestion
Off-schedules
Transport inadequacy
Unavailable transport information

Social & Government



Poor service delivery
Unemployment
Lack of innovation
Non-inclusiveness



Smart Cities Solutions:

ICT & non-ICT technologies

A smart city uses **ICT** to enhance quality, performance and interactivity of **urban services**, to reduce costs and resource consumption and to improve contact between citizens and government. (Wikipedia)

Make the best use of **data, technologies and available resources** to improve **city planning, management and service delivery**, and to **engage citizens and enhance accountability**. (WB docs)

ICT and non-ICT innovations

Energy

Smart meters, smart grid, renewable power generation, biomass, thermal & low carbon technologies

Transport

Intelligent transport system, smart parking, low emission vehicles, public vehicle charging

Water & Waste

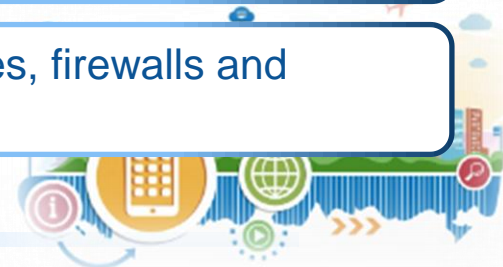
Smart water meters, circulation of water resources

Building

Energy efficient building design, refurbish of the existing buildings, smart appliances

Social & Govt

E-government, climate resilient communities, firewalls and protection, location-based services



India Smart Cities Mission – Building 100 Smart Cities

Accelerating economic growth via inclusive urbanization



Concept

- A City that has **basic infrastructure**
- uses **smart solutions** to make infrastructure and services better

Progress

- Launched in June, 2015, through City Challenge Competition, 100 selected cities will receive \$21M each year (FY16-20)



Two Pillars of Program

- **Area Based Development (85%):** Retrofitting/Redevelopment/Greenfield projects with basic infrastructure(water, sanitation, electricity..)
- **Pan-City Smart Solution (15%):** Application of ICT to municipal services and infrastructure **for the benefits of all the city residents**



India Smart Cities Mission – Building 100 Smart Cities

Accelerating economic growth via inclusive urbanization



Launch

Objective

- 98 urban centers and cities nominated by the state governments for the "Smart City" scheme, covering over 35% of total urban population
- **Top 20 cities selected on Jan 28, 2016 for funding in 2015-2016**
- Fast-track program to 23 States/UTs to upgrade their proposals
- Enabling local development and harnessing technology
- Drive economic growth and improve the quality of life of people

Rank	State/UT	City
1	Odisha	Bhubaneswar
2	Maharashtra	Pune
3	Rajasthan	Jaipur
4	Gujarat	Surat
5	Kerala	Kochi
6	Gujarat	Ahmedabad
7	Madhya Pradesh	Jabalpur
8	Andhra Pradesh	Visakhapatnam
9	Maharashtra	Solapur
10	Karnataka	Davanagere
11	Madhya Pradesh	Indore
12	Delhi	NDMC
13	Tamil Nadu	Coimbatore
14	Andhra Pradesh	Kakinada
15	Karnataka	Belagavi
16	Rajasthan	Udaipur
17	Assam	Guwahati
18	Tamil Nadu	Chennai
19	Punjab	Ludhiana
20	Madhya Pradesh	Bhopal



Winning City Proposals

Rank no.	Name of State/UT	Name of City	Score (%)
1	Odisha	Bhubaneswar	78.83
2	Maharashtra	Pune	77.42
3	Rajasthan	Jaipur	73.83
4	Gujarat	Surat	68.16
5	Kerala	Kochi	66.98
6	Gujarat	Ahmedabad	66.85
7	Madhya Pradesh	Jabalpur	63.03
8	Andhra Pradesh	Visakhapatnam	61.12
9	Maharashtra	Solapur	60.83
10	Karnataka	Davanagere	59.93

Cities to be Upgraded in Fast Track

S.No	Rank no.	Name of State/UT	Name of City	Score (%)
1	23	Telangana	Warangal	54.79
2	24	Chandigarh	Chandigarh	54.73
3	29	Uttar Pradesh	Lucknow	53.24
4	30	West Bengal	Newtown Kolkata	53.10
5	32	Goa	Panaji	52.99
6	39	Arunachal Pradesh	Pasighat	52.26
7	59	Himachal Pradesh	Dharmsghala	48.10
8	60	Haryana	Faridabad	47.86
9	62	Chhattisgarh	Raipur	47.60
10	65	Bihar	Bhagalpur	47.39



Seoul

Data-driven technological advances



- **Open data movement** encourages innovation and government transparency
- **Smart Seoul 2015**
 - Built up infrastructure and advanced smart services.
 - 120 Dasan call center
 - Smart Work Centers
- **Automated Smart water meters, energy saving app**
- **Internet connectivity:**
 - 97.5% households with broadband access
 - eSeoul, uSeoul, mSeoul
 - Free WiFi hotspots in parks and on public transport
 - Smart devices for all initiative: 78% of residents have access
- **Smart urban mobility:**
 - Tmoney (electronic currency), Upass (contactless public transport card)
 - Digital view terminals for realtime updates



Source: <http://newsroom.cisco.com/feature-content?articleId=1309662>

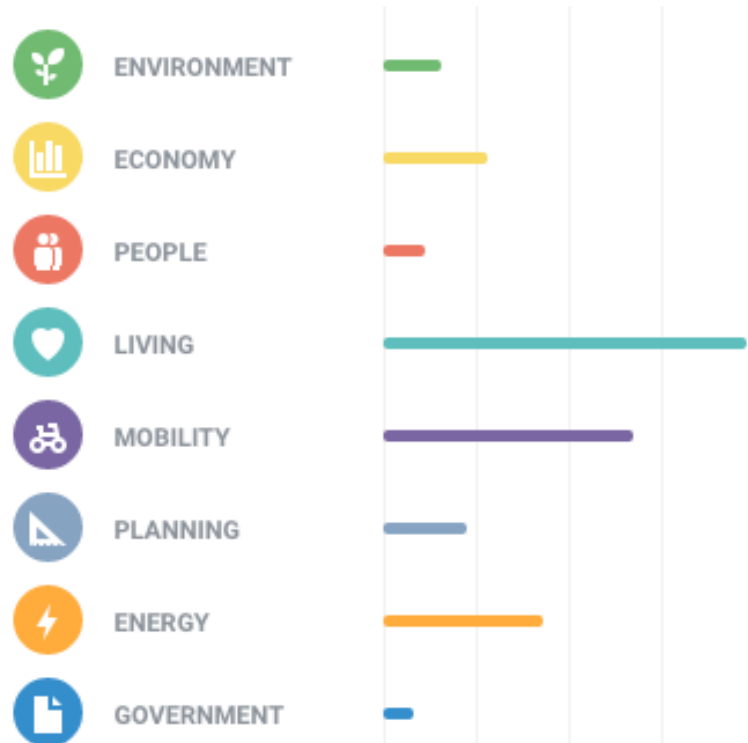


Barcelona

Working towards a Smart City in collaboration with the World Bank



€ 3.800.059.298



- Real-time trash cans status reporting
- Parking and biking apps for smart mobility
- Smart City Campus for urban innovation
- **22 ongoing public-private programs, particularly in transport and waste management**
- Europe Innovation Capital of 2014
- Named the Smartest City in the world for 2015 by Juniper Research
- Smart Cities Expo 2013-2015
- CitiSense Forum 2013-2015

Source: <http://www.barcinno.com/smart-city-barcelona/>



World Bank leveraging the “smart city” movement

Practices and experiences over the past 10 years

GP/VP/CCSA/IFC	Projects	Countries and Cities
Social, Urban, Rural & Resilience	Open Innovation in Cities, ICT-enabled Integration for Green Growth, Green City Development, Smart DRM	Globe, India, Brazil
Transport & ICT	Green Urban Transport, Xi'an City Intelligent Public Transport, Lima Metro Line 2, Kolkata Metropolitan, Heilongjiang Cold Weather Smart Public Transportation System	Xi'an, Yining, Lima, Heilongjiang, Rio de Janeiro, Wuhan, Lagos, Kolkata, China, Russia, Poland, Indonesia, Vietnam
Water	Output-Based Aid for Municipal Solid Waste Management	India, Nepal, Argentina
Energy	Smart Grids in MENA, Green Energy Schemes for Low-carbon City in Shanghai, Sustainable Urban Energy and Emissions Planning (SUEEP)	EAP, China, Jordan, Indonesia
Governance	SMART Government, e-Transformation, Leveraging Connectivity and E-Services for Improved Local Service Delivery	Vietnam, Brazil, Mongolia, Indonesia
Trade & Competitiveness	Competitive Cities, digital entrepreneurship ecosystem	Globe, Shanghai, Africa
LLI	eLearning on Smart Cities, Smart Cities topics on Innovation Policy platform	Globe, Colombia, Chile, Mexico, Lebanon
IFC	<ul style="list-style-type: none"> Cites Initiative \$6.8 billion in 221 city related projects and advisory services, additional 164 projects to 87 cities in 60 countries in 2004-2013 Transport, waste management, urban housing, heating, lighting, financing 	Hungary, China, South Africa, Cambodia, Colombia, Turkey, Romania, India



Social, Urban, Rural and Resilience WB Projects



Project Code	Project	Region and Details	TTL(s)
P154293	100 Smart Cities & 500 Cities Program	India, Technical Assistance (Non-lending), Just-in-Time, FY: 2018	Team Leader(s): Barjor E. Mehta, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice
P118238	BRAZIL: Green City Development	Brazil, Economic and Sector Work, Discrete, FY: 2011	Team Leader(s): Catalina Marulanda, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice , Requesting Unit: LCC5C, Responsible Unit: GSURR
P146716	Smart City Management, Global	World, Technical Assistance (Non-lending), Discrete, FY: 2016	Team Leader(s): Hyoung Gun Wang, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice , Requesting Unit: GSU12, Responsible Unit: GSU12
P156507	GEF China Sustainable Cities Integrated Approach Pilot	China, Global Environment Project, FY: 2017	Team Leader(s): Joanna Mclean Masic, Wanli Fang, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice , Requesting Unit: EACCF, Responsible Unit: GSU08 , Global Focal Area: Multi-focal area , Lending Instrument: Investment Project Financing



Social, Urban, Rural and Resilience WB Projects



Project Code	Project	Region and Details	TTL(s)
P130461	Output-Based Aid for Municipal Solid Waste Management	Nepal, Recipient Executed Activities, FY: 2013	Team Leader(s): Shenhua Wang, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice , Requesting Unit: SACNP, Responsible Unit: GSU12 , Lending Instrument: Specific Investment Loan
P089926	National Urban Solid Waste Management Project	Argentina, IBRD/IDA, FY: 2006	Team Leader(s): John Morton, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice , Requesting Unit: LCC7C, Responsible Unit: GSU10 , Lending Instrument: Sector Investment and Maintenance Loan
P151491	Shanghai 2050: building a competitive city in a globalizing world	China, Economic and Sector Work, Discrete, FY: 2016	Team Leader(s): Paul Procee, Practice Area (Lead): Social, Urban, Rural and Resilience Global Practice , Requesting Unit: EACCF, Responsible Unit: GSU08



Transport and ICT

WB Projects



Project Code	Project	Region and Details	TTL(s)
P152139	Learning from Best International Practice in Smart Transport and Energy Efficiency: Applications to WITDP and Beyond	China, Economic and Sector Work, Discrete, FY: 2016	Team Leader(s): Arturo Ardila-Gomez, Practice Area (Lead): Transport & ICT , Requesting Unit: EACCF, Responsible Unit: GTI02
P133114	Heilongjiang Cold Weather Smart Public Transportation System	China, IBRD/IDA, FY: 2014	Team Leader(s): Binyam Reja, Practice Area (Lead): Transport & ICT , Requesting Unit: EACCF, Responsible Unit: GTI02 , Lending Instrument: Investment Project Financing
P147695	Enhancing Public Management for Service Delivery in Rio de Janeiro	Brazil, IBRD/IDA, FY: 2014	Team Leader(s): Daniel Pulido, Practice Area (Lead): Transport & ICT , Requesting Unit: LCC5C, Responsible Unit: GTIDR , Lending Instrument: Development Policy Lending
P147292	Using locational data from mobile phones to improve the science of delivery	World, Economic and Sector Work, Discrete, FY: 2014	Team Leader(s): Timothy John Charles Kelly, Practice Area (Lead): Transport & ICT , Requesting Unit: GTIDR, Responsible Unit: GTIDR
P158796	Smart DRM: ICT readiness and application	World, Technical Assistance (Non-lending), Subtask of P152894, FY: 2017	Team Leader(s): Siou Chew Kuek, Naho Shibuya, Practice Area (Lead): Climate Change , Requesting Unit: GCCDR, Responsible Unit: GFDRR

Transport and ICT

WB Projects



Project Code	Project	Region and Details	TTL(s)
P100589	Sustainable Urban Transport (GEF)	India, Global Environment Project, FY: 2010	Team Leader(s): Nupur Gupta, Practice Area (Lead): Transport & ICT , Requesting Unit: SACIN, Responsible Unit: GTI06 , Global Focal Area: Climate change , Lending Instrument: Specific Investment Loan
P112956	Nigeria Lagos Urban Transport Project 2	Nigeria, IBRD/IDA, FY: 2010	Team Leader(s): Roger Gorham, Practice Area (Lead): Transport & ICT , Requesting Unit: AFCW2, Responsible Unit: GTI01 , Lending Instrument: Specific Investment Loan
P074726	Bogota Urban Services Project	Colombia, IBRD/IDA, FY: 2003	Team Leader(s): Mauricio Cuellar, Practice Area (Lead): Transport & ICT , Requesting Unit: LCC1C, Responsible Unit: GTIDR , Lending Instrument: Specific Investment Loan
P119654	GEF Guangdong Green Freight Demonstration Project	China, Global Environment Project, FY: 2011	Team Leader(s): Binyam Reja, Practice Area (Lead): Transport & ICT , Requesting Unit: EACCF, Responsible Unit: GTI02 , Global Focal Area: Climate change , Lending Instrument: Specific Investment Loan



Transport and ICT

WB Projects



Project Code	Project	Region and Details	TTL(s)
P157787	Shaanxi Xi'an City Intelligent Public Transport Project	China, IBRD/IDA, FY: 2018	Team Leader(s): Arturo Ardila Gomez, Yan Zong, Practice Area (Lead): Transport & ICT , Requesting Unit: EACCF, Responsible Unit: GTI02 , Lending Instrument: Investment Project Financing
P157956	Lima Metro Line 2 (Phase 2)	Peru, IBRD/IDA, FY: 2018	Team Leader(s): Georges Bianco Darido, Daniel Pulido, Practice Area (Lead): Transport & ICT , Requesting Unit: LCCPE, Responsible Unit: GTI04 , Lending Instrument: Investment Project Financing
P155591	Kolkata Metropolitan Urban Transport Integration Strategy	India, Technical Assistance (Non-lending), Discrete, FY: 2018	Team Leader(s): Rakhi Basu, Practice Area (Lead): Transport & ICT , Requesting Unit: SACIN, Responsible Unit: GTI06
P152288	IN: ICT-enabled Integration for Green Growth	India, Technical Assistance (Non-lending), Discrete, FY: 2018	Team Leader(s): Shashank Ojha, Practice Area (Lead): Transport & ICT , Requesting Unit: SACIN, Responsible Unit: GTI09
P155416	Smart Nation Action Plans and Solutions	World, Technical Assistance (Non-lending), Discrete, FY: 2017	Team Leader(s): Oleg V. Petrov, Practice Area (Lead): Transport & ICT , Requesting Unit: GTIDR, Responsible Unit: GTI09



Transport and ICT WB Projects



Project Code	Project	Region and Details	TTL(s)
P130891	MN: SMART Government	Mongolia, IBRD/IDA, FY: 2014	Team Leader(s): Tenzin Dolma Norbhu, Practice Area (Lead): Transport & ICT , Requesting Unit: EACCF, Responsible Unit: GTI09 , Lending Instrument: Investment
P157885	Leveraging Connectivity and E-Services for Improved Local Service Delivery	Indonesia, Technical Assistance (Non-lending), Discrete, FY: 2018	Team Leader(s): Natasha Beschorner, Practice Area (Lead): Transport & ICT , Requesting Unit: EACIF, Responsible Unit: GTIDR
P079344	Vietnam - ICT Development	Vietnam, IBRD/IDA, FY: 2006	Team Leader(s): Deepak T. Bhatia, Practice Area (Lead): Transport & ICT , Requesting Unit: EACVF, Responsible Unit: GTIDR , Lending Instrument: Specific Investment Loan
P147695	Enhancing Public Management for Service Delivery in Rio de Janeiro	Brazil, IBRD/IDA, FY: 2014	Team Leader(s): Daniel Pulido, Practice Area (Lead): Transport & ICT , Requesting Unit: LCC5C, Responsible Unit: GTIDR , Lending Instrument: Development Policy Lending
P131584	Leveraging High-level Experts, Leaders and Practitioners (HELP) for Smart Government and e-Transformation	World, Technical Assistance (Non-lending), Discrete, FY: 2014	Team Leader(s): Oleg V. Petrov, Practice Area (Lead): Transport & ICT , Requesting Unit: GTIDR, Responsible Unit: GTIDR



Transport and ICT WB Projects



Project Code	Project	Region and Details	TTL(s)
P133201	Improvement of Urban Transport Systems Project	Russian Federation, IBRD/IDA, FY: 2017	Team Leader(s): Jung Eun Oh, Practice Area (Lead): Transport & ICT , Requesting Unit: ECCU1, Responsible Unit: GTI03 , Lending Instrument: Investment Project Financing
P148489	Green Urban Transport Solutions for Sub National Governments	Poland, Technical Assistance (Non-lending), Discrete, FY: 2016	Team Leader(s): Maria Carolina Monsalve, Practice Area (Lead): Transport & ICT , Requesting Unit: ECCU5, Responsible Unit: GTI03
P130932	Smart Grids for Green Growth and Regional Integration in MENA	Jordan, Technical Assistance (Non-lending), Just-in-Time, FY: 2014	Team Leader(s): Rajendra Singh, Practice Area (Lead): Transport & ICT , Requesting Unit: MNC02, Responsible Unit: GTIDR
P146236	Urban Technology and Innovation Hub	World, Programmatic Approach, FY: 2017	Team Leader(s): Arturo Munte Kunigami, Practice Area (Lead): Transport & ICT , Requesting Unit: GTIDR, Responsible Unit: GTI09
P115647	E-Society and Innovation for Competitiveness (EIC) Project	Armenia, IBRD/IDA, FY: 2011	Team Leader(s): Sandra Sargent, Feyi Boroffice, Practice Area (Lead): Transport & ICT , Requesting Unit: ECCU3, Responsible Unit: GTI09 , Lending Instrument: Specific Investment Loan





Project Code	Project	Region and Details	TTL(s)
P130544	IN Karnataka Urban Water Supply Modernization Project	India, IBRD/IDA, FY: 2016	Team Leader(s): William D. Kingdom, Practice Area (Lead): Water , Requesting Unit: SACIN, Responsible Unit: GWA06 , Lending Instrument: Specific Investment Loan
P131914	Strengthening Local Government Capacity to Achieve Rural Sanitation Outcomes in India	India, Technical Assistance (Non-lending), Discrete, FY: 2016,	Team Leader(s): Jozef Petrus Maria Verhagen, Practice Area (Lead): Water , Requesting Unit: SACIN, Responsible Unit: GWASS
P131913	Strengthening Sector Policy & Monitoring in Rural Sanitation in Rural India	India, Technical Assistance (Non-lending), Discrete, FY: 2016	Team Leader(s): Jozef Petrus Maria Verhagen, Practice Area (Lead): Water , Requesting Unit: SACIN, Responsible Unit: GWASS
P154212	IN Evaluation of Water Services Public-Private Partnership Options for Small and Mid-Sized Cities in India	India, Technical Assistance (Non-lending), Just-in-Time, FY: 2015,	Team Leader(s): Josses Mugabi, Practice Area (Lead): Water , Requesting Unit: SACIN, Responsible Unit: GWA06



Energy and Extractives

WB Projects



Project Code	Project	Region and Details	TTL(s)
P149389	Capacity Building for Smart Grid Investments for Transmission and Distribution	Indonesia, Recipient Executed Activities, FY: 2014	Team Leader(s): Anh Nguyet Pham, Practice Area (Lead): Energy & Extractives , Requesting Unit: EACIF, Responsible Unit: GEE02 , Lending Instrument: Investment Project Financing
P127871	Capacity Building for Smart Grid Development in China	China, Technical Assistance (Non-lending), Discrete, FY: 2013	Team Leader(s): Ximing Peng, Practice Area (Lead): Energy & Extractives , Requesting Unit: EACCF, Responsible Unit: GEEDR
P130786	Urban Scale Building Energy Efficiency and Renewable Energy	China, Global Environment Project, FY: 2013	Team Leader(s): Todd M. Johnson, Paul Procee, Practice Area (Lead): Energy & Extractives , Requesting Unit: EACCF, Responsible Unit: GEE02 , Global Focal Area: Climate change , Lending Instrument: Specific Investment Loan
P127034	Green Energy Schemes for Low-carbon City in Shanghai	China, Global Environment Project, FY: 2013	Team Leader(s): Ximing Peng, Practice Area (Lead): Energy & Extractives , Requesting Unit: EACCF, Responsible Unit: GEE02 , Global Focal Area: Climate change , Lending Instrument: Financial Intermediary Loan



Innovation and Competitiveness

WB Projects



Project Code	Project	Region and Details	TTL(s)
P148372	Competitive Cities	World, Economic and Sector Work, Discrete, FY: 2016	Team Leader(s): Austin Francis Louis Kilroy, Megha Mukim, Practice Area (Lead): Trade & Competitiveness , Requesting Unit: GTCCS, Responsible Unit: GTCCS
P151932	KE Learning Platform on Open Innovation in Smart Cities	World, External Training, Standard, FY: 2016	Team Leader(s): Ilari Lindy, Victor Mulas, Requesting Unit: LLICS, Responsible Unit: LLIOL



Cities Initiative

IFC Projects



Project	Region	Details
Intelligent Mass Transit	Colombia	\$176 million financing to develop and operate the fare collection, fleet management, and real-time information technology system for Bogota's bus Integrated Public Transportation System, expected to benefit 6 million passengers daily.
Urban Water Systems Expansion	China	\$16 million loan to a private company investing and operating in the water supply and wastewater treatment sector in China's second and third tier cities
Urban Housing Solutions	Brazil	\$47 million debt and equity investment to a real estate developer to expand the supply of low-income housing in urban areas.
Metro Expansion	Turkey	\$68 million loan to the Metropolitan Municipality of Istanbul for the expansion of the metro system to the Asian side of the city.
District Heating	Romania	\$10 million loan to the municipality of Botosani to implement infrastructure upgrades, together with an advisory project to identify and implement technical and non-technical measures to improve operational efficiency and lower the cost of heat supply for the municipal district heating company.
Street Lighting	India	Advisory project to support India's Orissa State to upgrade its street lighting network under a public-private partnership that will improve energy efficiency and increase safety in areas currently without street light.
Credit Enhancement of Municipal Bond	South Africa	\$31 million partial credit guarantee of a local currency bond issue by the City of Johannesburg to support water and wastewater, electricity and roads projects.
Innovative Urban Waste Water Solution	Hungary	\$5 million venture capital investment in a Budapest based wastewater treatment company that is developing and deploying a next-generation biological wastewater treatment technology.
Mortgage Financing	Cambodia	\$5 million loan to Cambodia's largest bank to help finance residential mortgages—a new type of financing in Cambodia—to meet rising demand from home buyers.



Smart Cities KSB

is looking forward to
hearing from you.

