

Transforming Delhi into a sustainable economic hub

International best practices for urban development in Delhi



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Contents

Section	Page
Foreword from CII	04
Foreword from Grant Thornton in India	05
Urban development challenges faced by Delhi	06
Case studies	09
Grant Thornton's role in the Smart Cities Mission	15

Foreword from CII

Delhi has seen a great transformation since independence, and the pace of the development has increased in the last two decades. There has been a shift from the traditional rural community to a modern urban community, resulting in an urban drift.

This rising urbanisation in Delhi comes with the benefits of economic development. Urbanisation in Delhi is closely related with industrialisation, modernisation and rationalisation (urbanisation). Urban centres are the places of opportunities, knowledge banks, innovation, creativity and their commercialisation. At current prices, the Gross State Domestic Product (GSDP) of Delhi increased at a CAGR of 12.20% between 2011-12 and 2017-18 to reach INR 6.86 trillion (\$105.96 billion). The per capita GSDP increased at a CAGR of 10.09% between 2011-12 and 2017-18 to INR 402,056 (\$5,596). This is a significant pull for human capital and talent for economic sustenance. Beyond economic growth, urbanisation can also give rise to social equity by eroding the distinctions between caste and creed which are strongly present in the rural society.

However, rapid urbanisation is unsustainable as it brings with it social and environmental challenges. Unplanned urban growth causes strained infrastructure, growth of slums, environmental degradation, traffic problems and leads to high cost of living. Delhi's increasing population, vast and diverse land mass and poverty-induced rural-urban migration have posed challenges for the administrative leaders, policymakers and planners.

To overcome these challenges, the path of intelligent and sustainable urban development should drive economic growth which is socially inclusive and environment-friendly.

Nikhil Sawhney

Chairman
CII Delhi State



Foreword from Grant Thornton

The unceasing growth of population and urbanisation has created a need for innovative ways to handle urbanisation with minimal impact on the environment, citizen lifestyle and governance. This is evident as there is a significant increase of 33% in the annual migrant population in Delhi — the highest in 15 years — leading to air pollution, traffic congestion and failure in solid waste management. To manage these challenges, it is imperative to employ modern technology.

Initial integration of information communication technology (ICT) with city operations promoted the concepts of telicity, information city and digital city. Later, the conception of the Internet of Things (IoT) laid the foundation for smart cities, which support the city operations intelligently with minimal human interaction. Smart cities emerged as a solution to address the challenges that arise with the exponential growth of urbanisation and population. However, the smart city concept is still evolving and is yet to be mainstreamed throughout the globe due to technological, economic and governing barriers.

In this paper, Grant Thornton in India and CII Delhi aim to highlight various urban issues and challenges faced by Delhi. We intend to leverage our expertise of delivering solutions to smart cities and throw light on certain international best practices which may be replicated to develop Delhi as a sustainable economic hub.

Kunal Sood

Partner
Grant Thornton India LLP

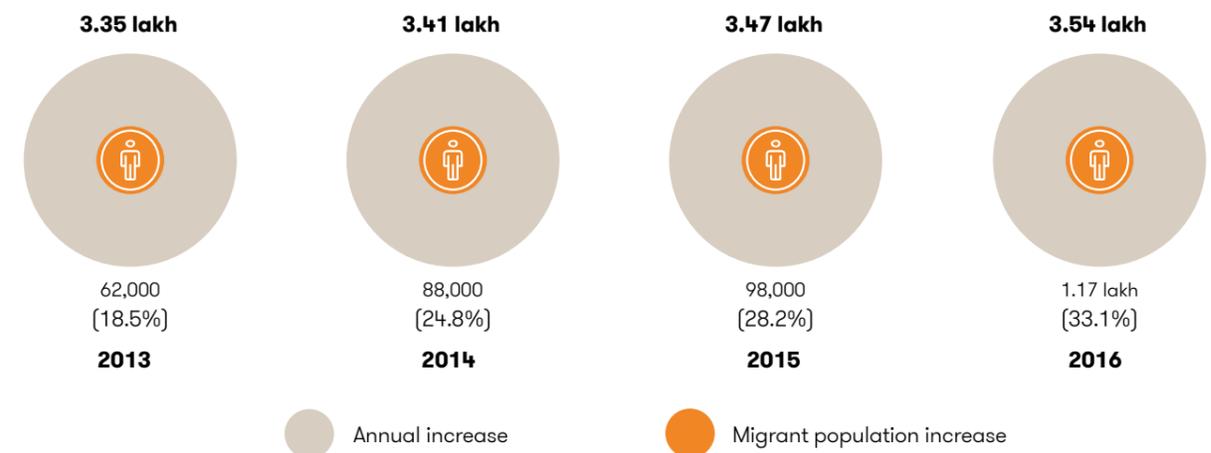


Urban development challenges faced by Delhi



Increasing economic activities in the capital and its highest per capita income among states are attracting people from different parts of the country, leading to an increase in the population figures. The share of migrants in the capital's population growth in 2016 reached 33% — the highest in 15 years. Delhi, being the capital, already has a large population density of 11,297 per sq. km.¹

Population migration



Source: Delhi Economic Survey 2018

However, a growing urban population leads to many challenges in maintaining the quality of life of the citizens.

The population of Delhi is anticipated to surpass 36 million by 2030², which is expected to put further pressure on the already scarce resources. Inefficient public transport coupled with a rise in income levels has led to a significant rise in the use of private vehicles in the past two decades. Waste disposal is another huge urban problem in Delhi which has resulted in the capital becoming the fourth most polluted city in the world.



¹ <http://niti.gov.in/content/population-density-sq-km>

² World Urbanisation Prospects, United Nations, July 2014

Case studies

Air pollution

- Delhi is the fourth most polluted city in the world.
- Transport sector accounts for over 23% of carbon emissions.
- Delhi adds 1,400 new vehicles to its roads every day.
- Central Pollution Control Board states that the use of transport contributes to more than 30% of the air pollution in Delhi.

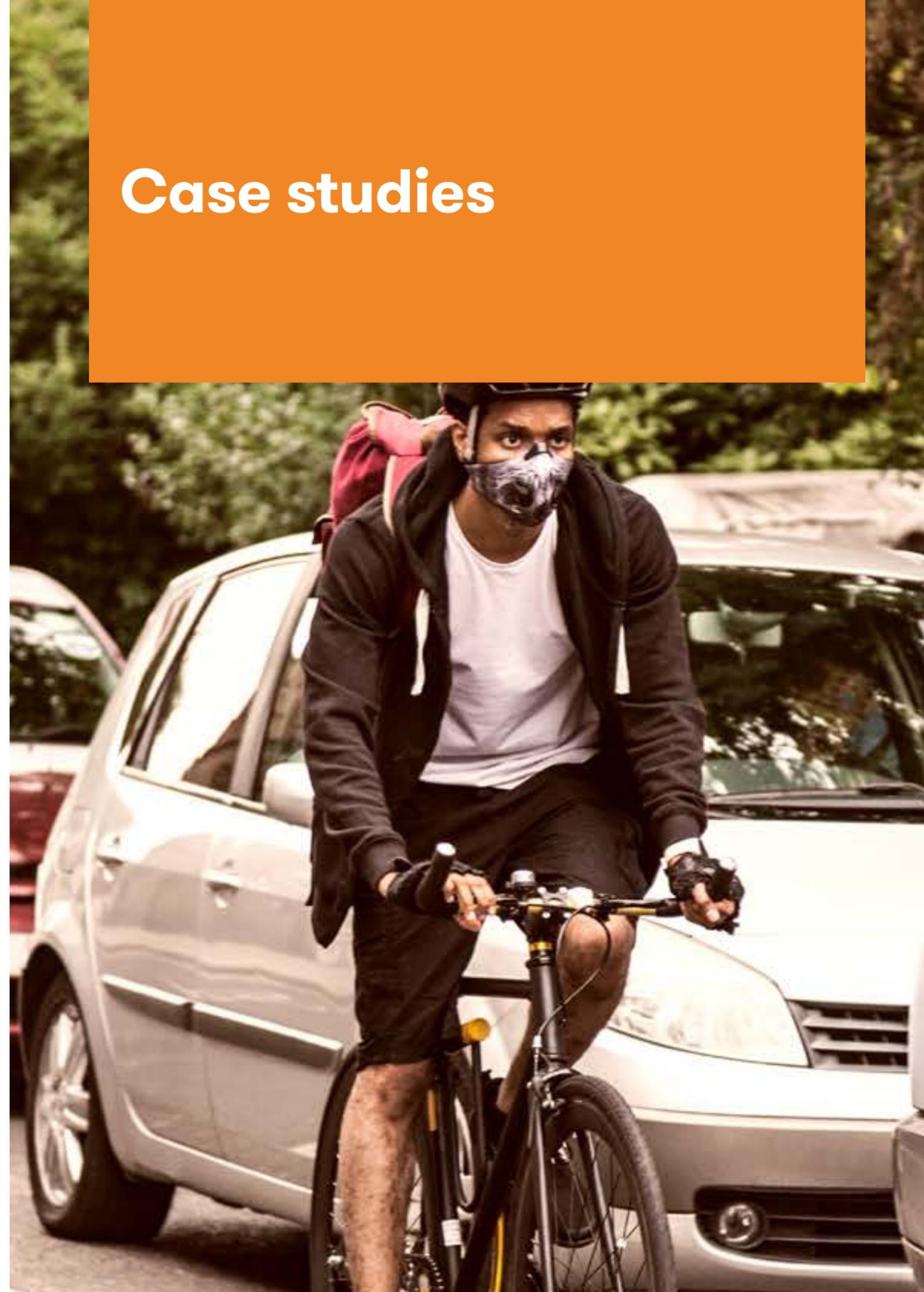
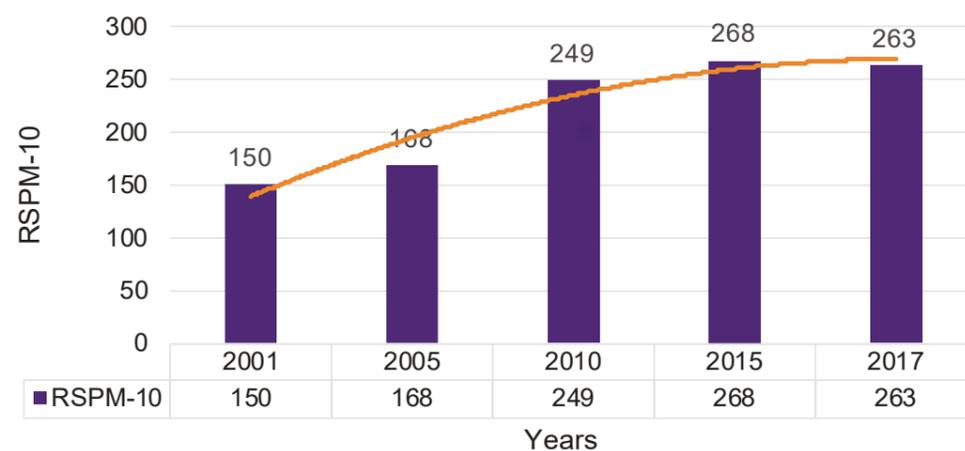
Solid waste

- 28 square kilometers of land is needed by 2020 for the capital to be able to dump 15,000 tonnes of solid waste daily.
- Three of Delhi's four landfills (waste mountains) are overdue for use.

Traffic congestion

- The city has a high road density of 2,103 km/100 sq. km.
- It has a V/C ratio of 1.01-2.83, which is way higher than the prescribed 0.7.
- Delhi has more vehicles than Mumbai, Chennai and Kolkata put together.
- 7 million man hours are lost daily due to traffic congestion.

Air pollution level
Delhi Economic Survey 2017-18



This section covers some international best practices around certain areas that may be viable for Delhi.

Air pollution

1. Beijing: Aggressive policies aimed at tackling some of the worst urban air pollution in the world

The problem

- The average PM 2.5 levels were often 6 times higher than WHO standards in China's urban areas.
- Such high levels of air pollution were estimated to cause approximately 1.2-1.64 million deaths per year in China.
- The high end of this range meant that air pollution was responsible for one out of every six deaths in China.

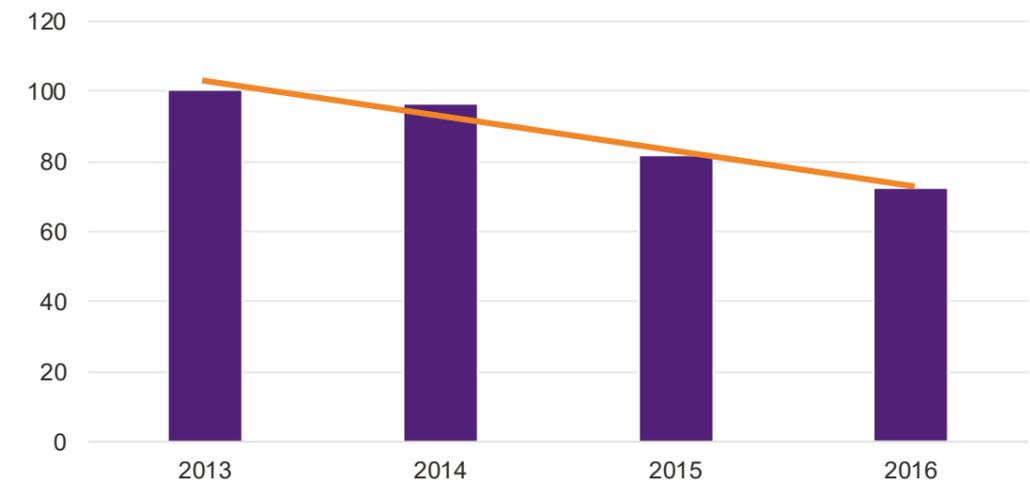
The process

- In 2012-2013, for the first time, the government issued standards for PM 2.5 levels.
- China has increased the enforcement powers of its environmental agencies, which had previously been criticised for lax enforcement.
- Achieving the new environmental standards has become a political priority, giving more incentives for local officials to take actions that, although may adversely impact GDP numbers by reducing excess production capacity, would benefit the environment.

The result

- Beijing's PM 2.5 levels decreased during the first half of 2015.
- From January to April, coal consumption in China was down 8% compared to the previous year.
- Production from some particularly polluting industrial sectors, such as steel, was flat or down through the first four months of the year.

Average pollution level in Beijing



Urban transport and mobility

1. Seoul: Late night bus service

- Evidence-based governance utilising big data: Late night bus (Owl Bus Service) is an intra-city bus operating after midnight for citizens' convenience and safe commute. These buses run from midnight to 5 am, when public transportation typically is not available.

The problem

- Seoul is home to 10 million people, and a large number of them required transport services between midnight and 5 am. During this time, only taxis would be available as a mode of transportation, leading to high waiting times and significant financial burden on the citizens.

The process

- The Seoul Metropolitan Government cooperated with mobile carriers, and collected and analysed 3 billion call data.
- With the taxi on/off data, the Seoul Metropolitan Government predicted people's commuting needs during the night.
- Owl Bus is a representative instance of public-private cooperation and adopting big data analysis for city governance. By using big data to predict the actual demand and adjust the bus routes, it was possible to cover most of the floating population with the least number of buses.

The result

- It was possible for Owl Bus to cover the most floating population with the least number of buses.
- The bus currently operates on nine bus routes with bus frequency of 40 minutes
- The late night bus provides services to 7,400 passengers per day

Source: Sustainable Seoul Smart City: Seoul e-Government –Seoul Metropolitan Government

Solid waste management

1. Municipality (Clean CAP): Melbourne City Council

Melbourne City Council has installed Clean CAPs in the area for tracking the trash fill speed in trash cans as it varies depending upon the area/location. Clean CAPs are attachable ultra-sonic fill level sensors that measure the amount of trash entering a trash can in real time.

The problem

- There was not enough data available regarding waste generation and collection performance.
- The number of workers did not meet the collection requirements.
- Overflowing bins created an unhygienic environment for the citizens.

The process

- The government planned the installation of 700 CleanCUBE (smart waste bins).
- 47 Clean CAPs were installed initially.
- Collections were performed using Clean City Networks (CCN) notification and real-time data.

The result

- Total collection and inefficient collection have been reduced by 25% when fill level is less than 30%.
- Time taken to respond to the problem of an overflowing bin has decreased by 71% with 35% fewer overflow occurrences.
- With reduced response time, overflow of bin has reduced by 85%, improving the hygiene conditions for the citizens.

Source: Implementing Smart Waste Management System in La Marsa, Tunisia – WeGo Feasibility Study 2017

Grant Thornton's role in the Smart Cities Mission

2. Municipality (Clean CAP): Seodaemun – District, Seoul

Operational costs for the administrative and collection staff were quite high given that waste collection took place four times every day due to overflowing bins. The Municipality adopted Clean CAPs to track the collection of waste data in real time in order to improve efficiency and reduce the operational costs of the staff.

The problem

- Overflowing bins hampered the image of the constituents.
- Collection for all bins was done four times a day.
- Such high collection frequency was only for high traffic areas' bins which were full enough.

The process

- Clean CAPs were retrofitted in 76 bins.
- Initial data revealed far too many collections.
- Data depicted varying collection requirements for different bins. As a result, Clean CAPs were incorporated so that collection requirements would not vary too much.

The result

- There was an increase in collection efficiency by 45% even though collection was reduced to 1.8 times from four times daily.
- Operational efficiency increased by 25%, giving enough time to two of the eight administrators to be re-allocated elsewhere
- The area got cleaner and with savings of \$950 per bin, total annual savings increased to \$72,700.

Source: Implementing Smart Waste Management System in La Marsa, Tunisia – WeGo Feasibility Study 2017



The Government of India, in the year 2015, launched the ambitious Smart Cities Mission to accelerate growth in physical infrastructure and improve urban administration to make cities more accommodative of urbanisation. The Smart Cities Mission proposes 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 solution”.

Grant Thornton India LLP is successfully running Project Management Consultancy services in seven proposed smart cities: Nagpur, Tumakuru, Jalandhar, Namchi, Gangtok, Sagar and Varanasi. In the latest Smart City rankings released by the Union Ministry of Housing and Urban Development, Nagpur tops the list.

The scope of work for the cities is designed considering the unique requirements of every city, with focus on domains such as smart mobility, smart living, smart governance and smart environment.

Some of the projects that we are involved in as part of the Smart Cities Mission in these domains are:

Category 1: Mobility and accessibility improvement

Component	Project	Implemented under
Sustainable and planned urban mobility	<ul style="list-style-type: none"> Smart parking Multi-level car parking Public market places Move People Initiative (E-buses) E-rickshaw Cremation facilities at Alley Gumpa Integrated bus terminal Public bicycle sharing system Intelligent Transport System Conversion of diesel autos to CNG and parking for autos Introduction of e-rickshaw with charging points for e-rickshaw Smart Buses with bus terminals and bus stops Smart roads and smart parking 	<ul style="list-style-type: none"> Varanasi Smart City Namchi Smart City Tumakuru Smart City Nagpur Smart City Jalandhar Smart City



Category 2: Liveability and improved quality of life

Component	Project	Implemented under
Recreation of urban green and restoration of heritage of the city	<ul style="list-style-type: none"> Roads junctions' improvement Ghats and facade improvement Public market places Retrofitting and construction of footpath Canal area rejuvenation Railway station development 	<ul style="list-style-type: none"> Varanasi Smart city Nagpur Smart City Jalandhar Smart City
Healthy and safe city	<ul style="list-style-type: none"> Smart parks Retrofitting of central park Development of multi-speciality hospital Development of 15 parks E-Health 	<ul style="list-style-type: none"> Varanasi Smart City Namchi Smart City Tumakuru Smart City Jalandhar Smart City
Clean Cleanliness (Clean Initiative)	<ul style="list-style-type: none"> Smart bins Environment monitoring Solid waste management at Wariana dump site in Jalandhar 	<ul style="list-style-type: none"> Namchi Smart City Tumakuru Smart City Jalandhar Smart City

Category 3: Ecology and environment

Component	Project	Implemented under
Sustainable core infrastructure	<ul style="list-style-type: none"> Solar rooftop PV system Grid interactive solar system Rooftop PV project Rooftop solar power Safety and Security and Utility ducting Roads and junctions improvement Project Tender SURE Integrated water supply distribution Management, conservation and rain water harvesting Street lighting control system 	<ul style="list-style-type: none"> Namchi Smart City Tumakuru Smart City Jalandhar Smart City Varanasi Smart City Nagpur Smart City

Category 4: Governance and public service management

Component	Project	Implemented under
Command centres and applications	<ul style="list-style-type: none"> Suraksha APP Intelligent signalling Variable Messaging System CCTV city surveillance Integrated Command and Control Centre Integrated City Management Control Centre Mission Jyoti mobile app Smart kiosk Smart City lounge 	<ul style="list-style-type: none"> Nagpur Smart City Tumakuru Smart City Varanasi Smart City Namchi Smart City Jalandhar Smart City
Smart energy	<ul style="list-style-type: none"> Solar LED lighting Street Lighting Control System 	<ul style="list-style-type: none"> Namchi Smart City Tumakuru Smart City
Citizen outreach programs	<ul style="list-style-type: none"> Project Kaushal Namchi Mahotsav 	<ul style="list-style-type: none"> Nagpur Smart City Namchi Smart City

Our marquee projects

- Designing and construction of roads, bridges, sidewalks, MEP works on Tender SURE concept for the ABD Area, Nagpur, Maharashtra, India.
- Designing, development, management and implementation of the Smart City Project under the Smart Cities Mission in Namchi – Integrated Water Supply Project, Namchi, Sikkim, India.
- Designing, development, management and implementation of the Smart City Project under the Smart Cities Mission in Namchi – Namchi Smart Pedestrian Walkway, Namchi, Sikkim, India.
- Installation of 50 KW off-grid solar photo voltaic (SPV) system at Govt PU College, Tumakuru, Karnataka, India.
- Construction of pathways and jogging track at Govt PU College, Tumakuru, Karnataka, India.

About CII



Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. Founded in 1895, India's premier business association has around 9000 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from around 265 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

As a developmental institution working towards India's overall growth with a special focus on India@75 in 2022, the CII theme for 2018-19, India RISE: Responsible. Inclusive. Sustainable. Entrepreneurial emphasizes Industry's role in partnering Government to accelerate India's growth and development. The focus will be on key enablers such as job creation; skill development; financing growth; promoting next gen manufacturing; sustainability; corporate social responsibility and governance and transparency.

With 65 offices, including 9 Centres of Excellence, in India, and 11 overseas offices in Australia, Bahrain, China, Egypt, France, Germany, Iran, Singapore, South Africa, UK, and USA, as well as institutional partnerships with 355 counterpart organizations in 126 countries, CII serves as a reference point for Indian industry and the international business community.

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