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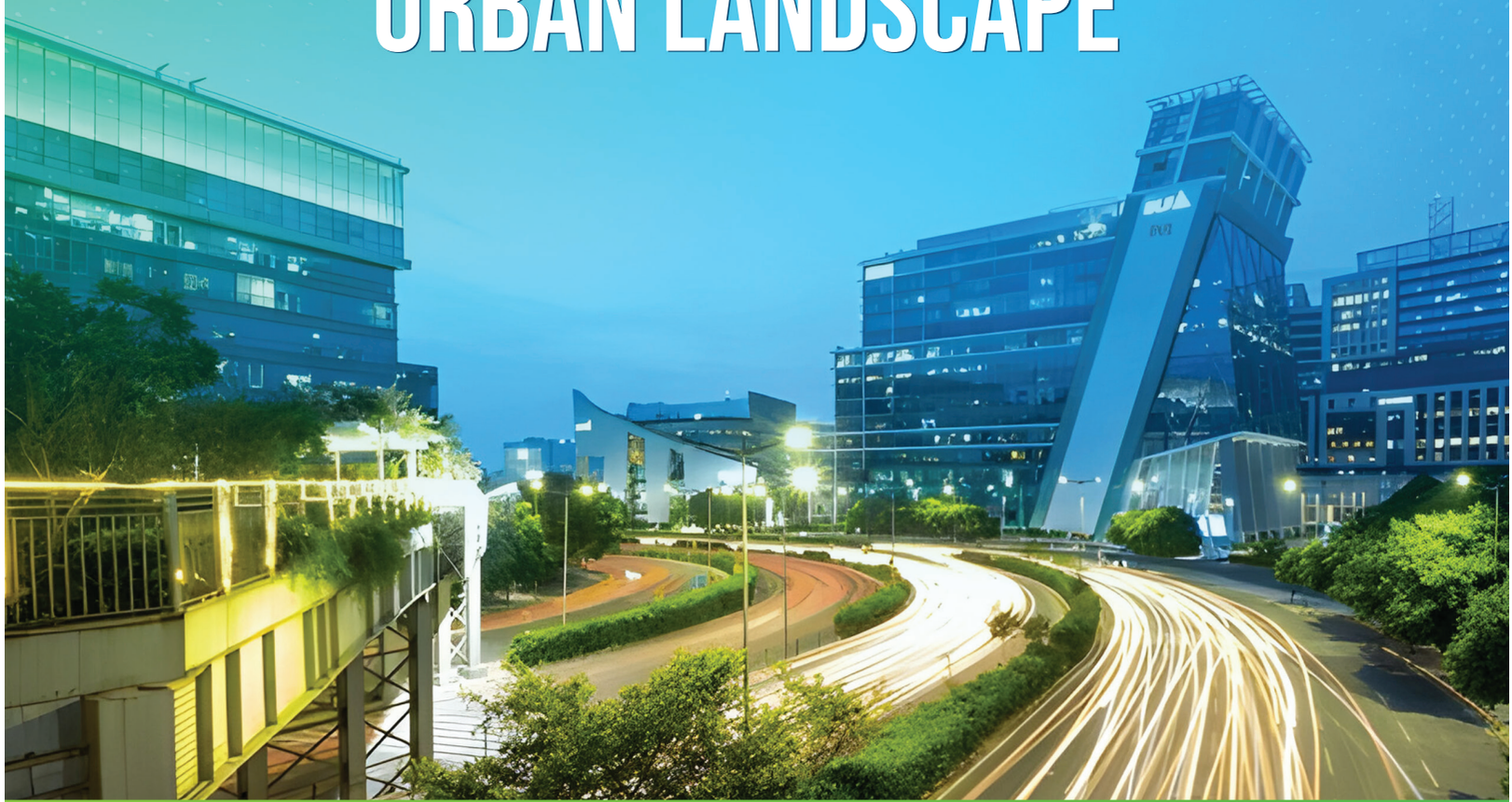
5th Elets National
URBAN INNOVATION SUMMIT
GURUGRAM

SUSTAINABLE CITIES

TRANSFORMING GURGAON'S URBAN LANDSCAPE



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built by delivery partners, built for delivery partners

A pledge for 100% deliveries by EVs

Zomato has joined the Climate Group's global EV100 initiative, **committing to 100% adoption of electric vehicles (EVs) by 2033** and to **net-zero emissions across the food ordering and delivery value chain**, making it the largest EV100 member in India. This step is part of Zomato's dedication to sustainability and climate action. By adopting EVs, we aim to significantly reduce carbon footprint and contribute to a cleaner, greener environment. This initiative not only supports the global push for eco-friendly transportation but also aligns with the long-term vision of making food delivery more sustainable and responsible for future generations.

Prioritising Road Safety & the exclusive 'Emergency Heroes' program

Zomato's goals align with India's road safety initiatives, aiming to reduce traffic-related fatalities and ensure safer, risk-free working conditions for delivery partners. Leading the way with **24x7 SOS Support and 12-min Ambulance service in 700+ cities**, Zomato also launched the flagship **"Emergency Heroes"** program. Under this initiative, **40,000+ delivery partners have already been trained to be certified first-responders across 47 cities**, to extend medical aid and assistance in roadside emergencies, and Zomato **aims to extend this training to 1L+ delivery partners by the end of 2024.** To further its commitment to delivery partner well-being, Zomato provides **an Accident Insurance of ₹10L, a Health & Critical Illness coverage of ₹1L and a Maternity Insurance of ₹40K** to its active delivery fleet.

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AUGUST 2024

Gurugram's Urban Revolution Balancing Growth with Sustainability

Gurugram's transformation from a small town to a global business hub is remarkable. The city has become a magnet for multinational corporations, entrepreneurs, and talent from across the globe. Yet, with growth comes responsibility. The challenge lies in sustaining this development while ensuring inclusivity, sustainability, and resilience.

Several pioneering initiatives mark urban development in Gurugram. The Municipal Corporation of Gurugram (MCG) has been at the forefront of implementing sustainable practices and leveraging technology to enhance governance and citizen engagement. From smart city projects to green infrastructure, Gurugram is paving the way for other cities to follow. This special edition features insightful articles by top government officials working relentlessly on urban innovation.

Key focus areas of this special issue include water management, where innovative solutions are being employed to ensure efficient water usage, rainwater harvesting, and recycling, addressing water scarcity while promoting sustainability. Waste management and cleanliness are critical areas where MCG sets standards through effective waste disposal and recycling initiatives, which are essential for enhancing urban living conditions.

Infrastructure development is another cornerstone of Gurugram's growth, with efforts to create robust transportation networks, energy solutions, and public amenities that support the city's expansion. Additionally, advancing smart mobility solutions is crucial for improving transportation efficiency and reducing congestion, with Gurugram embracing cutting-edge technologies to promote environmentally friendly commuting options.

The MCG has been instrumental in driving these changes, showcasing innovative solutions in urban planning, resource management, and community engagement. Its role in urban development is crucial as it fosters a resilient city environment by promoting sustainable practices and stakeholder collaboration.

The 5th Elets National Urban Innovation Summit is a platform for stakeholders to exchange ideas, share best practices, and forge partnerships. It offers an opportunity to learn from global experiences while tailoring solutions to local needs. The discussions and deliberations here will undoubtedly contribute to shaping Gurugram's future, ensuring it remains a city of opportunities and an example of sustainable urban development.

At Elets Technomedia, we are committed to driving meaningful conversations. We are proud to have witnessed and contributed to the discourse on urban innovation through our past collaborative platforms, hosting a series of Urban Innovation Summits in Lucknow, Ranchi, Noida, Jodhpur, and Chandigarh. Additionally, we have organised 35+ Smart City Summits nationwide to highlight the unique innovations driving urban transformation. This souvenir represents a collective effort to envision a future where cities are not only economic centers but also inclusive, livable, and resilient communities.

DR. RAVI GUPTA
Editor-in-Chief, eGov magazine, and
Founder, Publisher & CEO,
Elets Technomedia Pvt Ltd

https://egov.eletsonline.com/editorial/

Discovering Gurugram's

ACCELERATION AS THE MILLENIUM CITY

SRISHTI VERMA | Elets News Network (ENN)

Once a modest town bordering India's capital, Gurugram has transformed into the country's "Millennium City." This bustling hub now hosts over 1,000 companies, ranging from innovative startups like 1mg, BharatPe, and Cars24 to global tech giants like Google, Meta, and IBM. Gurugram's meteoric rise exemplifies radical urban development in India.

However, this rapid growth has brought significant challenges. The city now grapples with pressing sustainability concerns, affordability issues, and the need for cultural preservation. As Gurugram expands, it faces increasing infrastructure demands, particularly those related to water management, waste disposal, and urban mobility.

Rising to meet these multifaceted challenges, the Municipal Corporation of Gurugram (MCG) has implemented innovative solutions, positioning the IT hub at the forefront of urban development in India. These initiatives aim to balance the city's economic growth with environmental stewardship and quality of life for its residents.

Furthermore, the Gurugram Metropolitan Development Authority (GMDA) has approved a substantial budget of 2,887.32 crore for 2024-25, earmarked for ambitious projects addressing these pressing issues. This significant investment underscores the city's commitment to sustainable development and long-term planning.

As Gurugram continues to evolve, it is a prime example of

the opportunities and obstacles faced by rapidly developing urban centres in India. The city's approach to balancing growth with sustainability and livability may offer valuable lessons for other emerging metropolitan areas across the country, showcasing how modern urban planning can adapt to the complex needs of a burgeoning metropolis.

MCG and GMDA together are working to implement cutting-edge initiatives for the sustainable growth of Gurugram in the following ways:

The Gurugram Metropolitan Development Authority (GMDA) has approved a budget of ₹2887.32 Crore for the financial year 2024-25, with which Gurugram is embarking on ambitious projects to address these issues.

1. Innovation in Water Management

Water scarcity has been a critical issue for Gurugram, exacerbated by rapid urbanisation and population growth. Addressing this challenge required innovative water management solutions to ensure a sustainable supply and mitigate environmental impact. Various strategies have been implemented to tackle this issue effectively.

- ***Rainwater Harvesting and Groundwater Recharge***

The 'Catch the Rain' campaign in Gurugram aims to boost the construction of Rainwater Harvesting Structures (RHS). It is a Public-Private Partnership (PPP) initiative to bring about societal change and awareness. Also, Gurugram authorities have mandated the construction of RHS for new structures. The harvested water can be used for multiple purposes, significantly reducing groundwater and municipal supply dependency. Further, infrastructure projects like constructed wetlands and permeable pavements improve groundwater recharge.

- ***Wastewater Treatment and Reuse***

Gurugram's water management strategy includes establishing advanced wastewater treatment plants to ensure sewage and industrial effluents are treated to meet safety standards for reuse. Key projects include constructing a 100 MLD Water Treatment Plant Unit No. VI at Chandu Budhera, with an investment of ₹78 crore. Additionally, a 100 MLD Water Treatment Plant Unit No. IV at Basai has been approved at an estimated cost of ₹247 crore. The plan also includes augmenting the existing Main Pumping Station at Dhanwapur to a 650 MLD capacity, with an investment of ₹119 crore.

- ***Technology-Driven Water Distribution***

Technology has played a pivotal role in optimising water

distribution across the city. Smart water meters and IoT-based monitoring systems have been deployed to track water usage and detect leaks in real time. These systems provide valuable data that helps in efficient water management, reducing wastage, and ensuring equitable distribution. Additionally, predictive analytics forecasts water demand and supply trends, enabling proactive measures to address potential shortages.

In addition, regulatory guidelines and bylaws, such as the HARYANA building code, Model Building Byelaws, and Guidelines for Water Conservation, state strict regulatory policies for water conservation and management on societal and individual levels.

2. Waste Management

The exponential growth in population, companies, and industries has led to a corresponding rise in waste generation. Gurugram has implemented comprehensive and innovative waste management strategies to address this challenge.

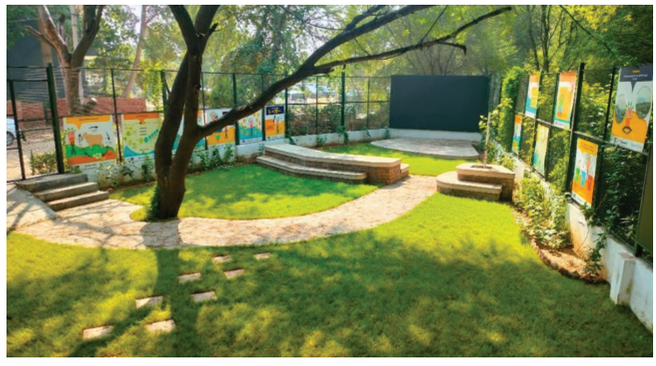
- ***Segregation at Source***

A cornerstone of effective waste management is the segregation of waste at its source. Gurugram's municipal authorities have launched extensive campaigns to educate residents and businesses about separating waste into biodegradable and non-biodegradable categories. This practice facilitates more efficient recycling and processing, reducing the burden on landfills and promoting a circular economy.

- ***Recycling and Waste-to-Energy Plants***

The city has established multiple recycling facilities and waste-to-energy plants to enhance waste management. These plants convert organic waste into biogas and compost, while non-recyclable waste is incinerated to generate electricity. The energy produced is fed into the grid, contributing to the city's power needs. This approach not only reduces waste destined for landfills but also harnesses its potential as a resource, aligning with sustainable development goals.

Smart water meters and IoT-based monitoring systems have been deployed to track water usage and detect leaks in real-time. These systems provide valuable data that helps in efficient water management, reducing wastage, and ensuring equitable distribution.



Arthshala: An open-air, lush-green amphitheatre at the site to conduct trainings and discussions

- ***Public-Private Partnerships***

Public-private partnerships have played a crucial role in improving Gurugram's waste management. Private companies have been engaged to provide door-to-door waste collection, transportation, and processing services, ensuring efficiency and accountability. These collaborations have resulted in the deployment of modern waste collection vehicles equipped with GPS tracking and Radio Frequency Identification (RFID) technology, enhancing operational efficiency and transparency.

- ***Community Involvement***

Community participation has been instrumental in the success of Gurugram's waste management initiatives. One notable example is Ecogram, the city's first integrated decentralised waste management and resource recovery centre. This community-driven project gives citizens a unique opportunity to understand how their waste should be processed to drive sustainability. At the Ecogram Centre, various types of waste are processed, with scientific disposal of around seven tonnes of municipal waste occurring daily.

3. Cleanliness of Gurugram

Maintaining cleanliness in a bustling metropolis like Gurugram is a formidable challenge. However, MCG has devised a smart, three-tier process for efficient waste collection and disposal. Additionally, various initiatives have been implemented to elevate the city's cleanliness standards.

- ***The Three-Tier Plan***

The three-tier plan adopts a comprehensive approach to cleanliness, addressing different aspects of waste management and public hygiene:

- **Tier I** focuses on daily street cleaning and waste collection, ensuring that public spaces remain clean and litter-free.

- ❒ **Tier II** involves periodic deep-cleaning operations, such as desilting drains, clearing illegal dumps, and disinfecting public areas.
- ❒ **Tier III** emphasizes long-term measures, including infrastructure development, policy formulation, and community engagement.

● ***Smart Technology Integration***

The integration of smart technology has been a game-changer in enhancing cleanliness. MCG has deployed GPS-enabled waste collection vehicles to ensure timely and efficient waste collection from designated areas. Additionally, IoT-based smart bins equipped with sensors have been installed across the city. These bins send real-time alerts when full, optimising waste collection routes and preventing overflow.

● ***Incentive Scheme for Clean Wards***

The Gurugram administration has introduced a reward system to motivate wards to maintain high standards of cleanliness. Wards that consistently maintain top cleanliness for two consecutive months are eligible for a reward of ₹1 crore. An independent agency evaluates the cleanliness of these wards, and the prize money can be utilised for the development of the respective areas.

This multi-faceted approach demonstrates Gurugram's commitment to maintaining a clean and hygienic urban environment, leveraging technology and community engagement to achieve its goals.

4. Technology Transforming Urban Governance

Technology has revolutionised urban governance in Gurugram, making it more efficient, transparent, and responsive. Implementing smart city solutions has transformed the delivery and management of municipal services, enhancing residents' overall quality of life.

Regulatory guidelines and bylaws, such as the HARYANA building code, Model Building Byelaws, and Guidelines for Water Conservation, state strict regulatory policies for water conservation and management on societal and individual levels.

5. Integrated Command and Control Centers

A cornerstone of smart urban governance is the establishment of Integrated Command and Control Centers (ICCCs). These centers serve as nerve centers for monitoring and managing various urban services, including traffic management, public safety, waste management, and utility services. By leveraging real-time data and advanced analytics, ICCCs enable prompt decision-making and efficient resource allocation. For instance, during emergencies such as natural disasters or public health crises, the ICCCs coordinate response efforts, ensuring swift and effective action.

● ***E-Governance Initiatives***

E-governance initiatives have streamlined interactions between citizens and municipal authorities. Online portals and mobile applications have been developed to facilitate the submission of grievances, payment of utility bills, issuance of permits, and access to various municipal services. These digital platforms have reduced bureaucratic delays, increased transparency, and improved service delivery. Additionally, e-governance has empowered citizens by providing easy access to information and enabling active participation in governance processes.

- ***Public Safety and Surveillance***

Ensuring public safety is a top priority for urban governance. Gurugram has implemented advanced surveillance systems, including high-definition CCTV cameras and Automated Number Plate Recognition (ANPR) systems, to monitor public spaces, particularly those that can be deserted and potentially unsafe at certain times.

Gurugram has established multiple recycling facilities and Waste-To-Energy plants to enhance waste management further. These plants convert organic waste into biogas and compost, while non-recyclable waste is incinerated to generate electricity.

- ***Energy Efficiency***

MCG has partnered with Energy Efficiency Services Ltd (EESL) to replace over 55,128 conventional street lights with energy-efficient LED lights. This initiative is expected to save over 4.5 MW of energy annually. The smart lights automatically adjust their brightness based on ambient light conditions and pedestrian movement, ensuring optimal illumination while conserving energy. Furthermore, they can be remotely monitored and controlled, facilitating timely maintenance and reducing operational costs.

These technological advancements demonstrate Gurugram's commitment to creating a smarter, safer, and more sustainable urban environment for its residents.

5. Smart Mobility Solutions

Mobility is imperative for a city like Gurugram, where countless people travel extensive distances daily. Consequently, city authorities have prioritized improving urban transportation.

- ***Comprehensive Mobility Management Plan (CMMP)***

GMDA has released a Comprehensive Mobility Management Plan to address traffic congestion and enhance public transportation. The plan includes developing integrated transport hubs, non-motorised transport options, and improved road infrastructure to streamline traffic flow and reduce pollution. A significant proposal was made to create a Unified Metropolitan Transport Authority (UMTA) for Gurugram to address overlapping transportation responsibilities.

- ***Electric Buses***

During GMDA's 13th meeting, the board approved the acquisition of 200 electric buses under the Gross Cost Contracting Model, with an expenditure of ₹69.66 crore. This initiative aims to provide Gurugram residents with safe, reliable, clean, and cost-effective city bus services. Introducing these electric buses will significantly reduce the city's carbon emissions and promote sustainable urban transportation. These buses will feature the latest technology to enhance passenger comfort and safety.

- ***Inter-city Connectivity***

Given that 66 per cent of Gurugram's traffic comes from Delhi-bound passengers, the city's traffic management must consider its intercity connectivity. The mass transit system emphasises developing strong regional linkages to enhance passenger movement in and around Delhi NCR. These initiatives demonstrate Gurugram's commitment to

enhancing urban mobility and creating a more sustainable, efficient transportation network for its residents.

6. Infrastructure and Connectivity

A smart city must have intelligent infrastructure and last-mile connectivity options to ease residents' lives. Gurugram has implemented several smart infrastructure and connectivity initiatives to enhance urban living and streamline city management.

One of the cornerstones of smart urban governance is the establishment of Integrated Command and Control Centers (ICCCs). These centres serve as nerve centres for monitoring and managing various urban services, including traffic management, public safety, waste management, and utility services. By leveraging real-time data and advanced analytics, ICCCs enable prompt decision-making and efficient resource allocation.

● ***Gurugram Metro***

The Gurugram Metro project aims to revolutionise the city's transportation by connecting New Gurugram with Old Gurugram via a 26.65 km elevated metro corridor with 26 stations. Managed by the newly established Gurugram Metro Rail Limited, the project also includes a 1.85 km spur line linking Basai Village to Dwarka Expressway. The development, costing approximately ₹5,452 crore, is anticipated to be completed within four years.

● ***Infrastructure Update***

A smart city's infrastructure requires regular updates, much like a smartphone. The GMDA authority has approved the upgrade of Tau Devi Lal Stadium in Gurugram at an estimated cost of ₹634.30 crore. This comprehensive renovation project aims to provide ultramodern sports infrastructure for athletes. The enhancements will include the construction of new training centres and state-of-the-art sports facilities. Modern systems and infrastructure will be incorporated to meet international standards, ensuring the stadium is equipped to host a wide range of sporting events and activities.

● ***Improvement in Last Mile Connectivity***

Recently, the Chief Minister of Haryana, Sh. Nayab Singh Saini, inaugurated various roads worth ₹13.76 crore and laid the foundation stone for 25 development projects. Major projects include the construction of service lanes on both sides of the Dwarka Expressway for ₹99.50 crore and the construction of GMDA's master road from IMT Manesar to Pataudi Road for ₹13.10 crore.

7. Cybersecurity

As the government transitions to digital modes of operation, cybersecurity becomes a critical issue. Gurugram authorities have made persistent efforts to address cyber security in their quest to build the perfect smart city.

● ***Gurugram Cyber Security Summer Internship Program (GPCSSI2024)***

GPCSSI2024, a flagship initiative of Gurugram police, offered a free 30-day course at "Cy-Lab" in Police Station Cyber East, Sector 43, Gurugram. This program, guided by cybersecurity expert Dr. Rakshit Tandon, invited 550 candidates from various backgrounds, including working professionals and college students. The course focused on teaching cybersecurity and promoting cyber safety, aiming to build a network of law-abiding netizens.

●***#GiveBackToGurugram Campaign***

The #GiveBackToGurugram Campaign aims to build a community of certified cyber-savvy citizens by utilising various media channels, including print, radio, social media, and public spaces. The campaign seeks to raise awareness about cybercrimes, foster public-private partnerships, and promote a safer digital environment in Gurugram.

● ***Gurugram Cyber Police***

Gurugram Cyber Police has launched various initiatives to raise awareness about cybersecurity issues and empower residents to protect themselves against cyber threats. A national helpline number - 1930 - is available for reporting cybercrime and offers resources and support for victims. Gurugram has a dedicated team to handle cybercrime cases and assist those affected. Additionally, Deputy Commissioner Nishant Kumar is working on creating a secure and scalable website to promote cybersecurity in the region.

Gurugram's water and waste management initiatives, cleanliness, and cybersecurity highlight its commitment to urban innovation. The city serves as a model for the nation, showcasing development strategies. Thanks to the tireless efforts of its authorities, Gurugram has become one of India's most hi-tech cities with sustainability at the core.

Enhancing Public Transport in Gurugram: A Collaborative Approach by MCG, Traffic Police, GMDA, and Metro Authority

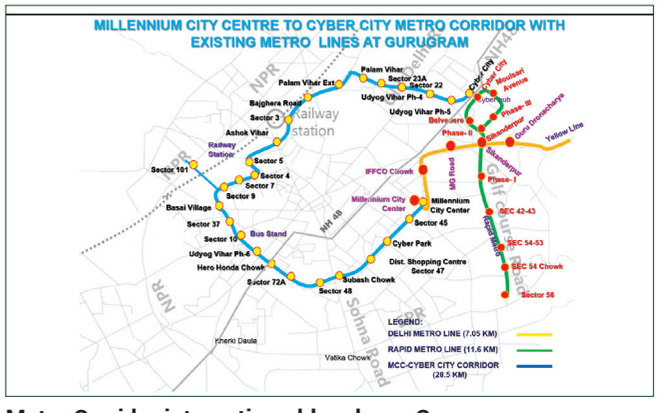
Over the past 25 years, Gurugram has experienced rapid development, transforming itself into a key urban centre within the National Capital Region (NCR) of India, located in the south of New Delhi. This growth has led to a significant increase in population, primarily driven by migration, resulting in escalating vehicle congestion. Consequently, there is an urgent need for an efficient and integrated public transport system to address these challenges. To achieve this, a collaborative effort involving:

- Municipal Corporation of Gurugram (MCG)
- The traffic police
- Gurugram Metropolitan Development Authority (GMDA)
- Gurugram Metro Rail Limited (GMRL) is essential to provide seamless, efficient, and user-friendly public transport for the city's residents.

The GMDA has formulated a Comprehensive Mobility Plan (CMP) that envisions creating an integrated and efficient public transport system. Key components of this plan include the expansion of the metro network and the implementation of Bus service through Gurugram Metropolitan City Bus Limited (GMCBL).

Additionally, the CMP prioritises non-motorised transport (NMT) infrastructure by dedicating cycling lanes and pedestrian-friendly zones to foster a balanced and environmentally friendly transport ecosystem. The plan also emphasises the use of Intelligent Transport Systems (ITS) for real-time traffic management and the development of smart traffic signals to optimise traffic flow. Furthermore, it advocates for the promotion of Electric Vehicle (EV) infrastructure and the establishment of green corridors. The CMP also supports Transit-Oriented Development (TOD), which aims to create high-density, mixed-use areas around transit hubs, encouraging compact, walkable communities.

The recent sanctioning of the Millennium City Centre to Cyber City Metro Line initiates a significant milestone in enhancing Gurugram's public transportation network. This project will add 28.5 kilometres of metro lines and 27 stations, connecting key commercial, institutional, industrial and residential hubs. The new metro line is expected to reduce travel time and alleviate city road congestion. By providing a direct and efficient link between Old and New Gurugram, this initiative is anticipated to boost economic activity, improve accessibility, and promote public transport over private vehicles, thereby encouraging a modal shift. This development aligns with Gurugram's broader goals for sustainable urban mobility and



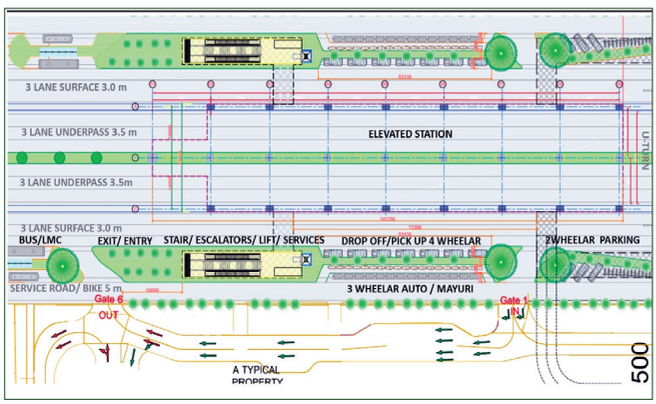
Metro Corridor integrating old and new Gurugram

Dr. Chander Shekhar Khare, IAS
Managing Director
Haryana Mass Rapid Transport Corporation Ltd. and Gurugram Metro Rail Ltd.

Namrita Kalsi
Chief Architect
Haryana Mass Rapid Transport Corporation (HMRTC)

represents a crucial step toward creating a more connected and commuter-friendly city.

GMRL plays a vital role in constructing and integrating the metro network. The corporation is responsible for the meticulous planning, design, and execution of metro lines and stations, ensuring they meet high standards of safety, accessibility, and efficiency. GMRL oversees the entire construction process, from initial surveys and land acquisition to deploying advanced engineering techniques and project management. By integrating sustainable practices and cutting-edge technology, GMRL aims to create a robust metro infrastructure that reduces traffic congestion, lowers pollution levels, and provides a reliable public transport option for Gurugram residents.



Indicative concept of multi-departmental traffic integration & intermodal transfer facilities

GMRL is also likely to play a vital role in multimodal integration by ensuring seamless connectivity between the metro system and various transit modes such as auto-rickshaws (like Mayuri), transport aggregators, automotive drop-offs, public bike sharing, ride-sharing services, feeder services and buses by providing bays. This integration aims to create a cohesive and efficient urban transport network, allowing passengers to easily switch between different modes of travel and ultimately facilitate model shift by developing a comprehensive and user-centric transport network which enables higher ridership through user experiences.

MCG and GMDA are complementary in enhancing street infrastructure to support multi-modal transport and walkability.

MCG focuses on the day-to-day management and improvement of urban roads, prioritising the creation of well-maintained, safe, and accessible streets. Key initiatives include:

- Widening of sidewalks
- Installation of pedestrian crossings
- Improvement of footpath railings to ensure a secure and pleasant walking environment

MCG can promote pedestrian pathways by developing wider, well-maintained sidewalks and designating pedestrian-only zones in busy areas. Safety enhancements, such as traffic calming measures, pedestrian signals, and improved lighting, are crucial, along with accessibility features like ramps and tactile paving. Incorporating street trees, public art, and clear signage will make pathways more attractive. At the same time, community engagement and collaborations with the private sector and Resident Welfare Associations (RWAs) can ensure vibrant, clean, and active streetscapes. Regular maintenance, educational campaigns, and integration with public transport hubs will further encourage walking, making Gurugram a more pedestrian-friendly city. These enhancements are vital for integrating various modes of transport, making walking a more attractive and practical option for residents and reducing dependency on private vehicles.

The GMDA contributes to long-term strategic planning and infrastructure projects that support a seamless multi-modal transport network. Their efforts include designing and implementing infrastructure that accommodates buses, bicycles, and other transit options alongside pedestrian facilities. By creating dedicated lanes and transit hubs, and integrating smart traffic management systems, GMDA ensures that different modes of transport are effectively connected. Additionally, their focus on developing green spaces and pedestrian-friendly urban designs enhances walkability, making it easier for residents to transition from

personal to public transport options while encouraging a more active and healthy lifestyle.

A 'Joint Metro Implementation Committee' is essential to realise this vision. This committee should include representatives from MCG, the traffic police, GMDA, the metro authority, and other infrastructure organisations like the National Highways Authority of India (NHAI) to coordinate transport planning, policy-making, and promotion of early implementation of proposed projects. The objective is to ensure that bus routes, metro lines, and other transport services are well-aligned and complement each other. Safety measures, including improved road safety protocols and surveillance systems, are integral to this plan. Additionally, stakeholder engagement and public awareness campaigns will be crucial to ensure community involvement and support. Key initiatives for enhancing public transport in Gurugram may include:

- **Development of Multimodal Transport Hubs:** Establishing transport hubs at key metro stations that integrate various modes of transport, including buses, e-rickshaws, auto-rickshaws, and bicycles, will provide seamless transfer options for commuters and significantly reduce the time and effort required for last-mile connectivity.
- **Feeder Services:** It is essential to introduce feeder bus and shuttle services that connect metro stations with residential and commercial areas. These services should be synchronized with metro schedules to minimize waiting times for passengers transferring between modes.
- **Bicycle Sharing Programs:** Implementing bicycle-sharing programs with docking stations at major transit hubs can promote cycling as a viable last-mile connectivity option. Dedicated bicycle lanes should be developed to ensure safe and convenient cycling routes.
- **Unified Ticketing System:** The National Common Mobility Card (NCMC) can simplify the user experience through a unified ticketing system that allows passengers to use a single card or mobile app for metro, buses, and other public transport services. This system should support cashless payments and provide integrated fare structures, offering discounts for the combined use of multiple transport modes.
- **Unified Information Platforms:** It is crucial to develop a unified platform that provides real-time information on metro services, bus schedules, and other public transport options. This platform can be a mobile app or a website, offering commuters real-time updates and helping them plan their journeys more efficiently.
- **Traffic Signal Coordination:** Coordinating traffic signals to prioritise buses and other public transport vehicles can enhance traffic flow and reduce delays. This strategy requires close cooperation between the traffic police and transport authorities.

The GMDA has formulated a Comprehensive Mobility Plan (CMP) to create an integrated and efficient public transport system. Key components of this plan include expanding the metro network and implementing bus service through Gurugram Metropolitan City Bus Limited (GMCBL).

- **Integrated Security Systems:** Comprehensive security measures at metro stations and transit hubs are essential to ensure commuter safety. These measures include CCTV surveillance, security personnel, and emergency response systems.
- **Public Safety Campaigns:** Conducting joint safety awareness campaigns can educate the public about safety protocols and emergency procedures, building commuter confidence in the public transport system.
- **Green Infrastructure Projects:** Implementing green building practices for transport infrastructure and promoting the use of renewable energy sources can support sustainable urban development.
- **Regulatory Standards:** Setting common standards and regulations for the operation of different transport modes ensures consistency and quality of service across the public transport system should be an important goal.
- **Smart Mobility Solutions:** Smart city technologies, including real-time tracking of buses and metro trains, digital signage at stations, QR codes, and mobile ticketing, can significantly enhance commuter convenience and operational efficiency.

By fostering a collaborative approach, MCG, the traffic police, GMDA, and GMRL can create a cohesive, efficient, and sustainable public transport system. This integrated effort will improve residents' daily commutes and support the city's long-term growth and development. Through coordinated planning, innovative solutions, and a commitment to sustainability, Gurugram can become a model for urban public transport in India, significantly enhancing the quality of life for its residents.

Views expressed by:
Dr. Chander Shekhar Khare, IAS
Managing Director, Haryana Mass Rapid Transport Corporation Ltd. and Gurugram Metro Rail Ltd.
&
Namrita Kalsi, *Chief Architect, Haryana Mass Rapid Transport Corporation (HMRTC)*

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"We are committed to equitable and sustainable development under the New Central Scheme"

Jammu and Kashmir has experienced revolutionary changes, especially in the industrial sector, in the past few years due to the ambitious initiatives taken by the state authorities. Dr. Arun Manhas, Director of Industries and Commerce (Jammu), UT of Jammu & Kashmir, in an exclusive interview with Nisha Samant of Elets News Network (ENN) discussed the steps taken by the government for the growth of the region. ***Edited Excerpts***

Jammu and Kashmir Urban Sector Development Investment Program focuses on improving water supply, urban transport, and drainage infrastructure in Jammu and Srinagar. Could you share some key milestones and achievements of this program so far?

The primary objective of our initiative is to significantly enhance the quality of life for residents of Jammu and Srinagar by focusing on key areas such as water supply, urban transport, and drainage infrastructure. This strategic approach is essential for sustainable regional urban development and has already yielded notable improvements. We have made substantial progress in ensuring a reliable and improved water supply system, which is fundamental for residents' daily needs. The transportation network has been modernised with the introduction of new smart electric buses that offer eco-friendly and efficient transit options. We have also strengthened local institutions and encouraged community involvement.

The 'Tawi Redevelopment Project' is reshaping Jammu's landscape and revitalising the Jhelum riverfront, Poloview market, and Lal Chowk, which have been transformed into modern areas, now staying open until midnight. We also focus on developing sustainable tourism spots promoting traditional crafts and handicrafts. The successful implementation of all

Bhagthalli in Kathua is set to become the next industrial centre, with an anticipated 14000 crore investment covering approximately 3000 Kanals.

Dr. Arun Manhas
Director of Industries and Commerce (Jammu), UT of Jammu & Kashmir

these projects has led to better health outcomes and cleaner living environments, stimulated economic growth with more vibrant commercial areas and extended business hours, and improved amenities and services, contributing to a higher standard of living. In addition to these advancements, we have upgraded existing roads, constructed new bridges, and initiated tunnel construction in remote areas. The expansion of the rail network will soon provide a direct connection between Srinagar and the rest of India, further integrating the region and enhancing accessibility.

Tawi Riverfront and Real Estate Development

The New Central Sector Scheme for Industrial Development of Jammu & Kashmir emphasizes environmental sustainability. Can you elaborate on the specific provisions of this scheme that promote green technologies and pollution control equipment?

In India, industries are categorised based on their pollution potential into four types:

- Red
- Orange
- Green
- White

This system is essential for effective environmental regulation and management. The categorisation considers factors such as raw materials, manufacturing processes, pollutants, wastewater discharge, and air emissions. We prioritise environmental regulation, conducting risk assessments, promoting sustainable development, and protecting public health. In our industrial estates, we adhere to strict environmental standards. Obtaining a "Consent to Operate" is mandatory for a unit to commence production. We ensure that all waste discharge is regulated and provide subsidies for pollution control equipment. Diesel generators in our estates are equipped with pollution control devices.

The Ghatti area in Kathua, previously isolated, has attracted significant investment—about 2000 crore in just three years.

We are committed to equitable and sustainable development under the New Central Scheme. Initially, industrial development was concentrated near urban centres, but we are now expanding into remote areas. Only Green Industries are permitted in the newly established Ghatti Industrial Estate near Kathua, adjacent to a wildlife sanctuary and water body. Additionally, industrial activities involving pesticides are heavily regulated. For us, sustainability is a continuous journey, guided by the motto "Reduce, Reuse, Recycle, Repeat" for the J&K Industries Department.

What are the key priorities for the Department of Industries & Commerce in terms of urban development over the next five years?

We are advancing with the development of 'medicities', IT towers, Foreign Direct Investments (FDI), multimodal logistics parks, and dry ports. Logistics, which involves the efficient management of goods, information, and resources, is increasingly pivotal to urban development. It transforms cities by enhancing transportation networks, establishing warehousing and distribution centres, and creating logistics corridors, which reshape landscapes and generate employment opportunities. Medicities represent the future of urban living, designed to improve lifestyle and healthcare accessibility. Our industrial activities are strategically located outside city limits,

which marks the gradual expansion of metropolitan areas.

For instance, once considered remote, 'Bari Brahmana' has evolved into a vibrant hub over the past 20 years. Similarly, the Ghatti area in Kathua, previously isolated, has attracted significant investment—about 2000 crore in just three years. Bhagthalli in Kathua is set to become the next industrial centre, with an anticipated 14000 crore investment covering approximately 3000 Kanals. This industrial growth stimulates local economies, driving demand for labour, goods, rental spaces, and new services such as restaurants and hotels. These developments create a cascading effect of forward and backward linkages, revitalising the city. Looking ahead, the Department of Industries & Commerce will prioritise sustainability in urban development. As we advance, we recognize that sustainability is not merely a trend but a necessity, and every effort counts in ensuring long-term environmental and economic health.

How does your department ensure that urban development projects in Jammu and Kashmir are inclusive and cater to the population's diverse needs?

To ensure that urban development projects are inclusive, our system must address several key factors such as:

- The needs of rural-to-urban migrants
- The diverse cultural and religious communities in the region
- The challenges posed by geographical terrain.

While prioritising large-scale projects, we also focus on supporting micro, small, and medium enterprises. We provide these smaller units with Prime Minister's Employment Generation Programme (PMEGP) loans to promote equitable growth. Our support extends to entrepreneurs with capital ranging from 10 lakhs to 2000 crores, under a scheme with an outlay of 28,400 crores. Our commitment to inclusive development is reflected in our efforts to comply with all relevant laws, including labour regulations and pollution norms. We maintain dedicated helplines to address any concerns. For instance, when an industrial unit faced closure, we ensured that all labour dues were settled before granting final approval for the closure. This demonstrates our commitment to ensuring corporate actions do not undermine inclusivity and equitable treatment.

Our support extends to entrepreneurs with capital ranging from 10 lakhs to 2000 crores, under a scheme with an outlay of 28,400 crores.

The growth of the industrial sector is crucial, but this must consider the environment. Can you share some initiatives taken by the Department of Industries & Commerce (Jammu) to ensure environmental safety along with industrial growth?

Under the Jammu and Kashmir Industrial Policy 2021-2030, several initiatives are being implemented to ensure environmental responsibility and sustainability. These include mandatory Environmental Impact Assessments (EIAs) for new industrial projects, regular inspections and monitoring of industrial units to ensure adherence to pollution control norms, and imposing penalties for non-compliance with environmental regulations. We incentivise green practices by offering financial incentives to industries that adopt green technologies and practices, providing subsidies for installing pollution control equipment, and giving preferential treatment in land allotment to eco-friendly industries.

The Department of Industries and Commerce promotes sustainable practices by encouraging the use of renewable energy sources in industrial processes, supporting waste reduction and recycling initiatives, and investing in research and development of clean technologies. We also focus on capacity building by organising workshops and training programs on environmental management and raising awareness about the importance of environmental sustainability. Additionally, we believe in the power of public-private partnerships. We collaborate with industry associations and NGOs to promote sustainable practices and encourage joint ventures for environmental projects.

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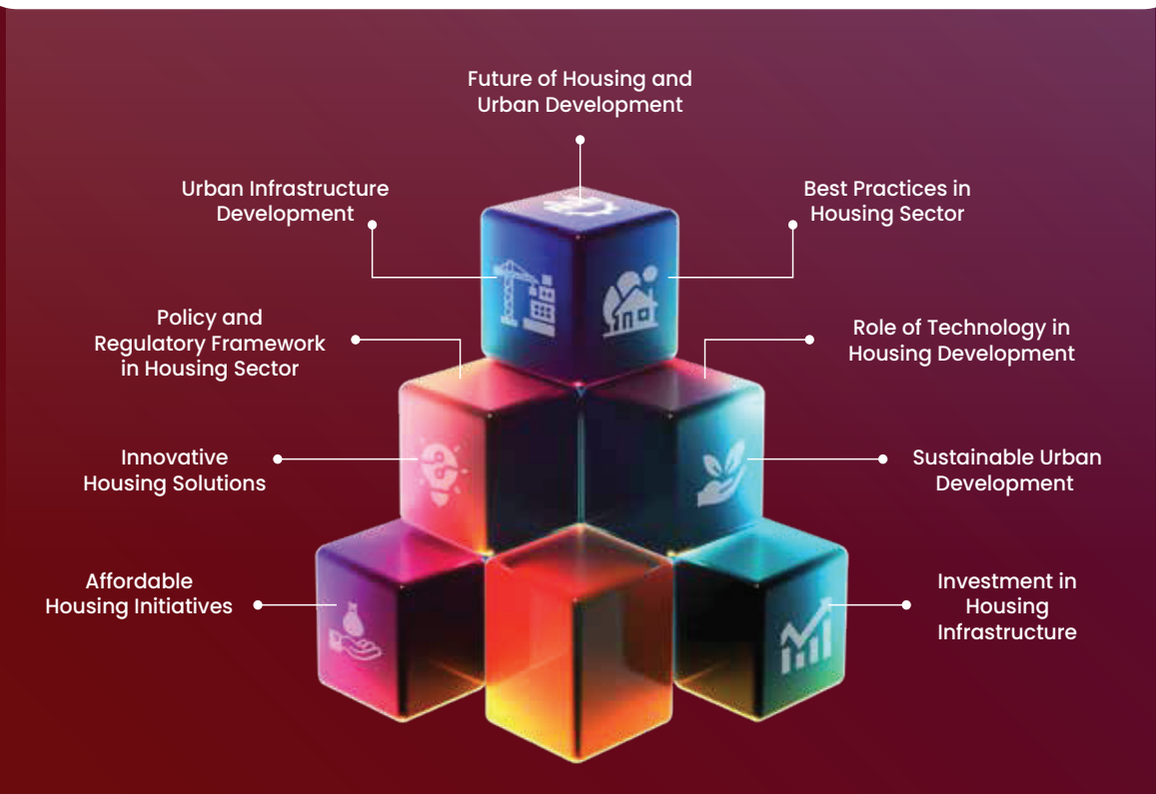
KEY DISCUSSION POINTS



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Steering the Giant:

Navigating Gurugram's Monumental Challenges Towards Growth and Sustainability

Dr. Narhari Banger, IAS
Municipal Commissioner
Municipal Corporation Gurugram (MCG)

The Municipal Corporation of Gurugram (MCG) transforms urban infrastructure with expanded roads, upgraded facilities, and improved amenities. MCG uses technology for real-time service monitoring, smart utilities, and advanced parking. Environ mental initiatives like green spaces, waste-to-energy projects, and electric waste management aim to reduce pollution and promote sustainability. Dr. Narhari Banger, IAS, Municipal Commissioner of Gurugram, outlines MCG's efforts to transform urban living in an exclusive interview with Ritika Srivastava from Elets News Network (ENN).

Edited by: **Abhineet Kumar** | Senior Sub-Editor (ENN)

With Gurugram being recognised as a millennium city, what steps is the Municipal Corporation of Gurugram (MCG) taking to enhance urban infrastructure and public services to support its growing population and economic activities?

As a millennium city, the Municipal Corporation of Gurugram focuses on enhancing urban infrastructure and public services to support growth and improve quality of life. We are investing in expanding and upgrading road networks and public transit systems to reduce congestion and improve commuting. We also enhance basic amenities such as water supply, sanitation, and healthcare facilities.

Additionally, we are developing state-of-the-art facilities, including international-level sports complexes, art and culture centres, senior citizen facilities, reading corners for the underprivileged, museums, and nature and heritage conservation initiatives. Our efforts include creating a large cultural and international sports complex at Wazirabad to establish Gurugram as a vibrant cultural hub. These initiatives promote sustainable development and ensure the city's resilience amid economic expansion.

Smart city initiatives are transforming urban governance and service delivery. How is the MCG leveraging technology to improve efficiency, transparency, and citizen engagement in Gurugram?

The Municipal Corporation is at the forefront of leveraging technology to enhance governance efficiency, transparency, and citizen engagement.

Key initiatives include:

- **Digital Platforms:** These are used for service delivery and real-time monitoring of urban services such as sewer connections, property tax, 'Saral registrations', and online grievance management.
- **Smart Utilities:** Implementation of smart metering and advanced parking systems, cloth bag vending machines.
- **Urban Cleanliness:** Use of power rodding, root cutter machines, super suckers, jetting machines, and sweeping

Under the ECOTHON Gurugram initiative, Municipal Corporation of Gurugram has launched several measures to enhance urban biodiversity, reduce pollution, and promote sustainable waste management.

and suction 'Jatayu machines' for road sweeping.

- **Citizen Feedback:** Engagement through call centres and mobile apps.
- **Digital Lab:** Creation of a digital lab within a new 24/7 public library.
- **Advanced Parking:** Development of three multilevel parking complexes with digital management systems.

These measures will streamline operations, enhance transparency, and improve the urban experience for our residents.

The Municipal Corporation is at the forefront of leveraging technology to enhance governance efficiency, transparency, and citizen engagement.

Gurugram has faced challenges related to water supply and management. What measures has the MCG taken to ensure adequate and sustainable water resources for the city?

Addressing water supply challenges is a top priority for our corporation. We have a 24-hour water supply plan to ensure uninterrupted service to the city. Comprehensive measures for sustainable water management have been implemented, including rainwater harvesting and efficient irrigation techniques in green belts and parks. Investments in water treatment and recycling facilities further support our efforts. Micro STPs have been established in parks, and the treated wastewater is used to maintain green belts, parks, and roads.

Furthermore, we are developing modular roads with integrated solar panels, emphasising our energy conservation and sustainability commitment. Through water conservation awareness campaigns and stringent regulations on water usage, we aim to secure our city's water resources for current and future generations.

These initiatives are essential for maintaining a reliable and resilient water supply infrastructure amidst growing urban demands.

Environmental sustainability is a cornerstone of our city's development strategy. The corporation has initiated several green initiatives under the ECOTHON Gurugram to enhance urban biodiversity, reduce pollution, and promote sustainable waste management practices.

Environmental sustainability is a critical concern for rapidly growing urban areas. What initiatives has the MCG implemented to promote green spaces, reduce pollution, and manage waste effectively in Gurugram?

Environmental sustainability is integral to our city's development strategy. Under the ECOTHON Gurugram initiative, the corporation has launched several measures to enhance urban biodiversity, reduce pollution, and promote sustainable waste management. This includes creating green spaces like parks and urban forests, using Electric Vehicles for eco-friendly waste transport, and implementing waste segregation and recycling programs along with awareness campaigns for citizen participation in sustainability. An MoU has been signed with NTPC to establish a Waste to Energy Green Charcoal Plant to tackle the massive challenge of Solid Waste Management in our ever-expanding city.

Moreover, we are developing a heritage park to celebrate Haryana's culture and history. We are enforcing the ban on Single-Use Plastic and promoting plastic alternatives in all sectors. We are working extensively to develop exemplary Bulk Waste Generators (BWG) waste management practices in the city. By integrating sustainability into urban planning and development policies, we aim to mitigate environmental impacts.

The role of the Municipal Corporation extends to fostering community engagement and addressing citizen grievances. How does the MCG ensure effective communication and responsiveness to the needs of Gurugram's residents?

Effective communication and responsiveness to citizen needs are integral to our municipal governance approach. The corporation has implemented robust mechanisms for citizen engagement, including public forums, regular Citizen Monitoring Committee meetings, community outreach programs, and digital platforms for feedback and grievance redressal.

A three-tier monitoring system for waste management involving citizen representatives has been established. Two committees with prominent citizen representatives have been set up to provide recommendations on door-to-door waste collection and the management of waste disposal and landfill sites. Regular meetings and participatory initiatives allow residents to contribute to decision-making processes actively.

By promoting transparency and ensuring timely grievance resolution, we aim to build trust and strengthen civic participation in shaping our city's future.

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Madhya Pradesh: A Pioneer in Sustainable Waste Management

Madhya Pradesh, the fifth most populous state and the second largest by area in India, has emerged as a national leader in sustainable waste management. With a population of over 70 million, the state's urban areas face significant challenges in managing Municipal Solid Waste (MSW). Through innovative practices and robust policies, Madhya Pradesh has transformed its waste management landscape, achieved numerous accolades, and set benchmarks for other states.

1. Solid Waste Management Initiatives

Madhya Pradesh has adopted independent solid waste management projects. Key projects and initiatives include:

- **Material Recovery Facilities (MRF):** The state has established 373 MRF units to process dry waste, ensuring effective recycling and resource recovery.
- **Home Composting:** Over 600,000 families in the state practice home composting, significantly reducing the organic waste burden on municipal systems.
- **Composting Facilities:** All 401 Urban Local Bodies (ULBs) in the state have composting facilities for wet waste, promoting organic waste recycling and reducing landfill dependency.

Impact and Outcomes

- **Cleanest State Recognition:** For the past seven years, Madhya Pradesh has consistently ranked among the top three cleanest states in the country in the 'Swachh Survekshan survey'.
- **Awards and Ratings:** The state has received 43 national awards, 156 Garbage-Free City (GFC) star ratings, and 361 Open Defecation Free (ODF++) certifications.
- **Urban Achievements:** Bhopal, the state capital, has been awarded a five-star rating for cleanliness and sustainability. Moreover, 157 cities in the state have achieved GFC star ratings, reflecting the widespread impact of the state's efforts.

2. Integrated Solid Waste Management Case Study: Rewa ISWM Project

The Integrated Solid Waste Management (SWM) Project in Rewa, a Public-Private Partnership (PPP) initiative, exemplifies the state's innovative approach. Launched in 2017, this project covers 28 ULBs.

Background

- PPP (Design, Build, Finance, Operate, and Transfer) for Integrated Solid Waste Management for a cluster of 28 ULBs
- The private operator is responsible for end-to-end SWM, covering municipal waste collection, transportation, processing, and disposal.
- Construction of Infrastructure (Transfer Stations, Processing Plant, Scientific Landfill Facility), O&M of facilities and vehicles
- **Comprehensive SWM:** The private operator handles the entire waste management process, from collection to scientific disposal.
- **Waste-to-Energy (WTE) Plant:** The project includes a 6 MW WTE plant that has been operational since February 2024. The plant processes 340 TPD of Municipal Solid Waste (MSW), producing compost and energy.

Akshay Temerwal, IAS
Additional Commissioner
Urban Administration &
Development Department
Government of Madhya Pradesh

Salient Features of the Contract


- Total Project Capex Cost is Rs. 158.67 Crore. The private Operator's share is Rs. 71.40 Crore.
- Operation cost: The private partner is being paid a monthly tipping fee of Rs. 1,740 per metric ton of MSW received at the ISWM facility.
- Payment of Capex only after achieving milestones for Performance Targets set in the Contract.
- The Private Partner will bear the additional expenditure if capital expenditure is exceeded
- Penalty to be imposed if minimum stipulated Performance Targets are not achieved in time (i.e. non-payment of a certain per cent of monthly tipping fee)

Impact and Outcomes

The Rewa ISWM project has significantly impacted the region's waste management and energy production. Key outcomes include:

- **Waste Processing:** The Waste-to-Energy (WTE) plant processes approximately 1.24 lakh tons of municipal solid waste (MSW) annually. This substantial waste processing capacity has dramatically reduced the burden on landfills and improved waste management efficiency in the region.
- **Energy Production:** The WTE plant produces more than 525 lakh units of electricity annually, valued at over Rs. 30 crores. This contributes to the region's energy supply and demonstrates the financial viability of waste-to-energy conversion.
- **Environmental Benefits:** By converting waste into energy, the project reduces greenhouse gas emissions associated with traditional waste disposal methods, such as landfilling. This contributes to a cleaner environment and aligns with sustainability goals. Assuming the plant reduces emissions by approximately 1 ton of CO_2 per ton of waste processed, the project can generate around 1.24 lakh carbon credits annually, resulting in additional annual revenue of more than Rs. 8 crore from carbon credits.

Overall, the Rewa ISWM project demonstrates the effectiveness of integrated solid waste management solutions in addressing urban waste challenges while generating economic and environmental benefits.

3. Bioremediation and Legacy Waste Management

Madhya Pradesh has also made significant strides in managing legacy waste through bioremediation and scientific capping:

- **Indore City Forest:** The bioremediation of a dumpsite in Indore transformed over 100 acres of land into a city forest, reclaiming land worth Rs. 300 crore and planting 1.5 lakh trees.
- **Bhopal Dumpsite Remediation:** The Bhanpur Khanti dumpsite in Bhopal underwent bioremediation and capping, reclaiming 21 acres of land worth Rs. 130 crores. The project, costing Rs. 42 crores, showcases effective legacy waste management and land reclamation.

Impact and Outcomes

- **Land Reclamation:** 121 acres of land, valued at Rs. 430 crores, were reclaimed in Indore and Bhopal for urban development and green spaces.
- **Environmental Restoration:** Planting 1.5 lakh trees in Indore improved air quality, reduced urban heat, and enhanced biodiversity.
- **Reduction of Environmental Hazards:** Bioremediation and capping reduced risks like leachate contamination and methane emissions, improving public health.

Overall, Madhya Pradesh's bioremediation projects demonstrate the potential to transform urban landscapes, restore environmental health, and generate significant economic and social benefits.

Madhya Pradesh's holistic approach to waste management, combining technological innovation, community engagement, and strong policy frameworks, has positioned it as a pioneer in sustainable waste management. The state's achievements serve as a model for other regions, demonstrating the impact of concerted efforts and strategic partnerships in creating cleaner, more sustainable urban environments.

Views expressed by: **Akshay Temerwal**, IAS, Additional Commissioner, Urban Administration & Development Department, Government of Madhya Pradesh

Transforming Gujarat: Achievements and Future Goals of Urban Development

In recent years, Gujarat's Urban Development Department has launched several key initiatives to bolster urban infrastructure. Under AMRUT 1.0 and 2.0, the state has enhanced water supply, sewage systems, and green spaces. The Smart City Mission has seen 354 projects worth over ₹11,455 Cr, improving services like traffic management and public Wi-Fi. The Swarnim Jayanti Mukhyamantri Shahri Vikas Yojna invested ₹42,615 Cr in infrastructure upgrades. Efforts also include affordable housing through innovative technologies and public-private partnerships, addressing urban challenges and promoting sustainability, shared Shalini Duhan, IAS, Deputy Secretary, Urban Development Department, Government of Gujarat, in an exclusive interview with Hemangini Kanth Rajput of Elets News Network.

Edited by: Abhineet Kumar | Senior Sub-Editor | Elets News Network (ENN)

What are some key initiatives the Urban Development Department took in recent years to improve urban infrastructure in Gujarat?

The Urban Development Department in Gujarat has undertaken several key initiatives in recent years to enhance urban infrastructure across the state. These initiatives are intended to promote sustainable urban development, improve the quality of life for residents, and foster economic growth. Here are some notable initiatives under which the state has upgraded and fostered infrastructure services.

AMRUT 1.0: AMRUT is providing essential services (e.g. water supply, sewage, urban transport) to households and building amenities in cities which improve the quality of life for all, especially people experiencing poverty and the disadvantaged section is a national priority.

In Gujarat, 354 projects worth over ₹11,455 Cr have been initiated; 338 projects worth ₹10,793 Cr are completed, and 16 projects worth Rs. 662 Cr are ongoing. Gujarat consistently ranks among the top five states, with all six cities in the top 50 Smart Cities and two cities in the top five nationally.

Shalini Duhan, IAS
Deputy Secretary
Urban Development Department
Government of Gujarat

Sr. No	Sector	Part	Achievement
1	**Water Supply**	Treatment Capacity	> 300 MLD
2	**Sewerage**	Treatment Capacity	> 1000 MLD
3	**Drainage**	Storm Water Drain	flood mitigation in more than 200 waterlogged points
4	**Urban Transport**	Footpath	>130 km
		Cycle Track	>30 km
5	**Green Space**		> 100 Ha

AMRUT 2.0: A step towards AatmaNirbhar Bharat aims to make the cities 'water secure' and provide functional water tap connections to all households. This will be achieved through a circular economy of water by affecting water source conservation, rejuvenating water bodies and wells, recycling/reusing treated used water, and rainwater harvesting by involving the community.

Target Area in the State Gujarat	
Project	**Beneficiary**
Water supply	All 164 ULB + Ahmedabad Cantonment Board
Sewer/ Septage Management	31 AMRUT Cities
Rejuvenation of water bodies	All 164 ULBs

Smart City Mission: The Government of India launched the Smart City Mission in June 2015 to enhance infrastructure, quality of life, and sustainability. In Gujarat, 354 projects worth over Rs. 11,455 Cr have been initiated; 338 projects worth Rs. 10,793 Cr are completed, and 16 projects worth Rs. 662 Cr are ongoing. Gujarat consistently ranks among the top five states, with all six cities in the top 50 Smart Cities and two cities in the top five nationally.

Swarnim Jayanti Mukhyamantri Shahri Vikas Yojna (SJMMSVY) Under the Swarnim Jayanti Mukhyamantri Shahri Vikas Yojna (SJMMSVY), Gujarat has invested Rs. 42,615 Cr from 2009 to 2022 to upgrade city infrastructure, including water supply, drainage, renewable energy, and urban bus services.

Details on the number of projects executed & grant amount used under the SJMMSVY scheme for the last four financial years are mentioned below:

Sr. No	No. of Projects executed	Expenditure Amount (In Cr)
1	4,235	10,113.99

Renewable Energy: To promote self-reliance and net-zero emissions, the Urban Development & Urban Housing Department plans to install 250 MW and 150 MW renewable energy facilities for Municipal Corporations and Municipalities, respectively. Additionally, efforts are underway to install solar plants at STPs and WTPs to cut electricity costs.

Affordable Housing: Initiatives, such as the Mukhyamantri Gruh Yojana, aim to provide housing for low-income and economically weaker sections, promoting inclusive urban development in Gujarat.

How is Gujarat progressing under the Smart Cities Mission? Could you highlight some specific projects and their impact?

Under the Smart Cities Mission, six cities in Gujarat—Ahmedabad, Surat, Vadodara, Rajkot, Gandhinagar, and Dahod—were selected. A total of 354 projects worth over Rs. 11,455 Cr were initiated, with 338 projects valued at Rs. 10,793 Cr completed and 16 projects worth Rs. 662 Cr ongoing. Key projects include:

- Command and Control Center
- Integrated Transit Management System
- BRTS - Bus Rapid Transit System, various innovative services related to routes
- Easy management of civic amenities
- CCTV Surveillance System
- Water management through SCADA
- Planning of Smart Parking and Traffic Monitoring
- Grievance Redressal Mechanism for Citizens
- Construction of City Square
- Renovation of Gardens
- Modern approach to Solid Waste Management
- Robust Infrastructure
- Slum Redevelopment to Affordable Housing
- City Wi-Fi system

Gujarat's Development

Impact of Projects under Smart Cities

Surat's Command-and-Control Centre integrates various Departments for real-time monitoring and control, focusing on traffic regulation, surveillance, emergency response, and real-time service tracking. The centre employs advanced intelligent solutions, including a city surveillance system, traffic management system, public Wi-Fi hotspots, Variable Messaging Displays, bright lighting, virtual messaging boards, and a public address system.

Key features include zero tolerance for red light violations with Automatic Number Plate Recognition (ANPR) and the use of traffic congestion and vehicle count data for urban planning and air quality improvement. Surveillance cameras at traffic junctions help identify waterlogging early, preventing traffic jams during the monsoon season.

The Integrated Transit Management System (ITMS) offers a unified IT backbone for real-time monitoring of BRTS fleets, providing a people-centric, environment-friendly, and efficient transport system. This innovative bus system adapts to the city's growing footfall through IoT and extensive data analysis.

The iLAB Foundation supports various start-ups by offering guidance, incubation facilities, an expert panel of mentors, a joint facility centre, and a professional co-working space. This support has been crucial in transforming innovative ideas into successful ventures.

The Water SCADA project allows remote monitoring of flow and pressure in the water network. Data analysis helps determine actual supply quantities and forecast demand. The project's dashboard alerts engineers to deviations in key performance indicators, enhancing water supply service delivery.

In Dahod, Chhab Talav and Gardens have been developed as green and water-sensitive public spaces. Six gardens have been rejuvenated, with Chhab Talav being a central feature of public life. The lakefront includes a jogging track, paved pedestrian walkways, street furniture, and activity areas. Other developments include a cycle track, landscaped tree avenue gardens, green spaces, ghats, lake cleanliness initiatives, and water quality improvements through aeration.

Affordable housing is a critical issue in urban development. What measures has the Department taken to address this issue?

Gujarat is one of India's fastest-growing states, experiencing rapid economic growth and urbanisation. This urban expansion presents significant challenges, particularly in providing affordable housing to new migrants to prevent the proliferation of slums. The Government of Gujarat has proactively launched an ambitious program to rehabilitate slum dwellers and create affordable housing across major urban centres.

The iLAB Foundation supports various start-ups by offering guidance, incubation facilities, an expert panel of mentors, a joint facility centre, and a professional co-working space. This support has been crucial in transforming innovative ideas into successful ventures.

Some Affordable Housing Initiatives

Land Pooling Mechanism: The Gujarat Housing Board, Urban Local Bodies (ULBs), and urban authorities provide land for affordable housing at nominal rates. They utilise land banks from ULC surplus land, reserved land for EWS housing in Town Planning schemes, and government lands. A Residential Affordable Housing Zone has been established in Ahmedabad, introducing inclusive planning norms and providing houses with necessary facilities.

Innovative Technologies: Over 50,000 houses have been constructed using new, innovative technologies. Under the Global Housing Technology Challenge (GHTC), Gujarat is one of six states selected to implement a lighthouse project in Rajkot. The project features 1,144 houses worth Rs. 119 Cr, constructed with monolithic concrete using tunnel formwork technology.

Direct Benefit Transfer (DBT): Under the Beneficiaries Led Construction (BLC) program, eligible EWS families receive Rs. 3.5 lakh per house directly into their accounts to construct new homes. This process is monitored through geo-tagging, making Gujarat a frontrunner in implementing the Pradhan Mantri Awas Yojana (Urban). As of January 2023, 9,78,684 houses were sanctioned, with 8,55,279 completed.

Key Milestones of Pradhan Mantri Awas Yojana in Gujarat

- As of January 2023, Gujarat has made significant progress under the Pradhan Mantri Awas Yojana. Against a housing demand of 7.64 lakhs, 8.62 lakh houses were approved, with 7.41 lakh completed. Achievements include:
- Affordable Housing in Partnership (AHP): 1,74,050 units
- In-situ Slum Redevelopment (PPP): 56,955 units
- Credit Linked Subsidies Scheme (CLSS): 4,91,999 units
- Beneficiary Led Construction (BLC): 1,38,614 units
- Houses provided through AHP and ISSR include amenities like PNG gas pipelines, solar rooftops, and social infrastructure. BLC assistance is disbursed directly to beneficiaries via DBT.

Rapid urbanisation brings various challenges. What are Gujarat's significant challenges in urban development, and how is the Department addressing them?

India's population, growing at a decadal rate of 17.7%, is on track to make it the most populous nation globally. By 2036, 40% of Indians will live in urban areas, contributing 70% to the GDP. Gujarat, surpassing the national urbanisation rate of 31.16% in 2011 with 43%, is projected to reach 54% by 2031. As urbanisation transforms urban settings, developing physical, social, and digital infrastructure is crucial for sustained growth.

Key Issues and Challenges

- **Delineation Problems:** Identifying physical limits and boundaries.
- **Limited Capacity and Resources:** Local authorities need help with quality urban planning and financial constraints. They often rely on panchayats in peri-urban areas that lack financial and technical resources.
- **High Infrastructure Needs:** Disproportionately high infrastructure demands compared to other city parts.
- **Makeshift Arrangements:** Reliance on borewells and soak pits.
- **Environmental Concerns:** Urban flooding, loss of green cover, pollution from MSW and C&D waste, groundwater depletion, and unplanned hardscape.

Visionary Initiatives

Strengthening Urban Infrastructure

- The urban budget has increased 100 times over two decades.
- The "Swarnim Jayanti Mukhya Mantri Shaheri Vikas Yojana" (SJMMSVY) supports essential infrastructure projects like water supply and underground drainage.

Sustainable Urban Development

- Implementation of schemes like Har Ghar Jal, SBM, PMAY Urban, AMRUT, and Smart Cities Mission.
- Focus on solar power, treated wastewater reuse, zero untreated waste disposal, and river/lake revival projects.

Enhancing Urban Mobility

- BRTS is operational in three cities, and METRO is planned to create a multi-modal integrated transport system in major cities.

Inclusive Housing Initiatives

- Recognised for exemplary performance under PMAY (U) with multiple awards.

Digital Governance Reforms

- Town Planning and Valuation Department initiatives include:

- ❒ Online availability of 400 TP Schemes and 475 more in a year.
- ❒ 105 Cities/Town Development Plans converted to GIS.
- ❒ Reduced preparation time for development plans.
- ❒ ODPS 2.0 was launched for centralised online building permission applications, reducing the average processing time from 90 to 28 days.

Gujarat's commitment to urban development is evident in these initiatives, aiming to enhance the quality of life for its urban population and foster sustainable growth.

How is the department incorporating sustainability and green practices into urban development projects?

Aligned with national sustainability targets, Gujarat's government has made significant strides in creating livable, green cities. **The Chief Minister's Urban Bus Service (CMUBS)** supports green mobility through strategic financing, including viability gap funding, and aims to add 2,864 buses across major cities, including 300 new electric buses.

Launched in 2018, CMUBS covers eight municipal corporations and 22 A-class municipalities. It promotes sustainable mobility and reduces urban transport emissions, which account for one-third of city emissions.

Additionally, Gujarat plans to install 250 MW and 150 MW renewable energy facilities for municipal corporations and municipalities to support net-zero emissions. Solar plants are being set up at STPs and WTPs to cut electricity consumption, furthering the state's commitment to sustainability and green practices.

Efficient public transportation is crucial for urban areas. What steps are being taken to enhance public transit in Gujarat's cities?

Efficient public transportation is vital for urban areas. Gujarat is making significant strides to enhance its public transportation through various initiatives.

The **Chief Minister Urban Bus Services (CMUBS)** Scheme, launched in 2018, covers municipal corporations and 22 class "A" municipalities. The scheme aims to add 2864 city buses on the Gross Cost Contract Model. Urban Local Bodies (ULBs) receive 50% of the cost as Viability Gap Funding (VGF): up to Rs. 12.5 per km per bus for CNG buses and Rs. 25 per km per bus for electric buses. So far, 1293 buses have been added, including 464 electric buses in major cities like Ahmedabad, Rajkot, Surat, and Gandhinagar.

Nine cities (Mehsana, Porbandar, Morbi, Navsari, Vapi, Bharuch, Surendranagar—Dudhrej Municipalities and Jamnagar Municipal Corporation) have started new city bus services.

New 464 electric buses have been added in four major cities (Ahmedabad, Rajkot, Surat, and Gandhinagar). A total of 793 CNG (660 old replacement and 133 new) buses in 12 cities are being approved (Mehsana, Porbandar, Morbi, Navsari, Vapi, Bharuch, Surendranagar—Dudhrej Municipalities and Ahmedabad, Surat, Vadodara, Jamnagar Municipal Corporation).

The Fleet is of 464 e-Buses so far.

- AMC: 200
- SMC: 119 + 81 (Jan 2023)
- Rajkot: 44
- GMC: 20 (Ahmedabad - Gandhinagar)

An Integrated Traffic and Mobility Administration Centre has been implemented to manage city traffic and mobility, encompassing BRTS, city buses, traffic police, RTO, fire, and emergency services. Key components include:

- **E-Challan System:** Digital traffic enforcement, generating e-challans worth Rs. 341.53 Cr in six intelligent cities.
- **AI-based Road Monitoring:** Alerts for traffic congestion, roadblocks, damages, and wrong-side driving.
- **Traffic Volume Data Analysis:** Understanding traffic trends in various areas.
- **Waterlogging Hotspots Identification:** 12,000 CCTV cameras were installed across four major cities.

Under the FAME I & II schemes, which support electric mobility, Gujarat has received a sanction for 700 e-buses. This aligns with India's push towards clean mobility in public transport. These initiatives mark significant progress in enhancing urban transportation in Gujarat.

How does the department engage with local communities to ensure their needs and concerns are addressed in urban development projects?

A participatory approach to urban development is crucial to

enhancing cities' inclusivity, sustainability, and livability. Gujarat has initiated various interventions to foster collaborative and transparent governance systems as a citizen-centric state. Some significant initiatives include:

Common Card Payment System (CCPS) - Jan Mitra Card in Smart City Ahmedabad

The "One Card Many Services" project is a one-stop solution for all payment needs, enabling a multimodal transport journey through a single one-loop card.

Benefits and Outcomes

- Provides transit service ticketing for BRTS, AMTS, airport shuttles, and future metro services.
- Facilitates payments for all municipal services and retail transactions at malls, restaurants, and movie theatres.
- Available at over 100 service delivery points in the city.
- It is currently used by more than 500,000 people.

Citizen Complaint Redressal System (CCRS) in Smart City Ahmedabad

CCRS is a web-based enterprise solution that enhances citizen satisfaction through comprehensive service management and efficient service delivery. It automates the entire complaint process, from registration to closure.

Important Initiatives

- Dedicated Call Center: 155303 Citizen Complaint and Grievance Redressal Call Center.
- Handles over 1,500 calls daily.
- We have customised complaint management system for all zones and wards in Ahmedabad.
- Dedicated mobile app and web link for complaint registration.

Outcomes

- Over 4.5 million complaints registered since the project's inception.
- Command Centre tracks complaints and manages resolutions efficiently.
- Enforces service-level policies to ensure timely attention to complaints.

Integrated Command & Control Center (ICCC) in Smart Cities

ICCCs have been successfully set up in six major cities of Gujarat to enhance existing service delivery and achieve optimal utilisation of municipal assets. These centres provide robust online infrastructure and 24x7 city-wide wireless connectivity to aid various city operations.

Key Features

- Identifies urban challenges across sectors, including mobility, water supply, sanitation, and security.
- Enables timely actions and builds greater faith and trust among citizens.

e-Nagar Portal

- Launched in 2017-18, the e-Nagar Portal revolutionises citizen services in Gujarat by leveraging technological advancements. It serves as a centralised platform for the smooth delivery of services such as paying professional tax, building use permissions, water and drainage services, and issuing marriage, birth, and death certificates.

Key Features

- Transforms citizen perception of administrative machinery.
- Provides a 24x7 complaint and grievance redressal facility to support citizens and gather feedback for service improvement.

Online Development Permission System (ODPS)

ODPS promotes ease of doing business by setting up a transparent, efficient, and convenient system for streamlining essential services in the real estate sector. Gujarat was the first state to launch ODPS 2.0, which provides single-window clearance for building construction permissions and reduces approval time from two to three months to 48 hours.

Key Features

- Adopts transparency, decisiveness, sensitivity, and progressiveness.
- Creates a thriving urban economic ecosystem.

Can you discuss the role of public-private partnerships in urban development in Gujarat?

Public-private partnerships (PPPs) play a significant role in urban development in Gujarat, as they do in many regions globally. With its dynamic economy and ambitious urbanisation agenda, Gujarat has actively embraced PPPs to leverage the expertise and resources of both the public and private sectors in driving sustainable urban development.

Key initiatives include

- Development of EV stations and bus operations on PPP mode.
- Comprehensive solid waste management in cities.
- First state to implement PPPs for in-situ slum redevelopment under PMAY (U).
- Surat's pioneering use of treated wastewater generated INR 140 Cr in FY 2022-23 for various purposes.

What are your vision and goals for urban development in Gujarat? Are there any upcoming projects or policies that you are particularly excited about?

Gujarat's rapidly growing state economy is making strides toward transformative urban changes. The Vision Gujarat@2047 document outlines strategies for developing city agglomerations into vibrant socio-economic centres. Key targets include achieving 100% piped drinking water supply, enhanced per capita water supply, and 100% wastewater recycling or reuse by 2030. The urban budget has increased from INR 175 Cr in 2003 to INR 21,067 Cr for FY 2024-25.

Key initiatives include:

- Establishment of a State High-level Planning Committee
- Launch of Nirmal Gujarat 2.0 for city cleanliness
- Energy transition infrastructure in municipal corporations
- Iconic infrastructure projects like Sabarmati Riverfront Metro services in Rajkot and Vadodara
- Digital initiatives such as ODPS 3.0 and E-Nagar 2.0
- Upcoming standard purchase policy for municipalities

Under Nirmal Gujarat 2.0, municipalities receive funding for waste collection vehicles, a Safai grant, Nirmal Path, cleaning Garbage Vulnerable Points, waste processing plants, and capacity-building programs. The state plans to install 250 MW and 150 MW renewable energy facilities for municipal corporations and municipalities, respectively.

The Ahmedabad Metro Rail project, with Phase 1 operational, aims to boost connectivity. Expansion plans for Phase 2 are underway. Sustainability efforts include adding an e-bus fleet to BRTS, developing public charging stations, and setting up charging infrastructure.

How is the department leveraging technology and innovation to improve urban infrastructure and services?

Technological advancements and IT tools are significantly transforming urban governance nationwide, enhancing citizen engagement and creating more efficient, livable cities. Key initiatives include:

State-level services

- **Urban Project Management Dashboard:** This dashboard monitors 1,005 projects worth Rs. 20,324 Crores, used by eight municipal corporations and 6 RCMs. Based on KPIs, projects are categorised into red, yellow, and green for prompt action and smooth implementation.
- **Web-GIS and TP Scheme Digitisation:** Enhances citizens' access to TP scheme-related documents.
- **e-Nagar Portal:** This offers end-to-end citizen-centric services across ULBs, such as tax payments, building permissions, and certificates. It is available via mobile app, reducing queues at ULB offices.
- **Integrated Online Revenue Applications (IoRA)** is a comprehensive platform for revenue-related services like digital Record of Rights (RoR), land conversion certificates, and inheritance certificates.
- **ODPS Portal:** Provides a single window clearance for building construction permission using advanced technology.

Smart City services

- **Smart City Mission:** Six cities in Gujarat (Ahmedabad, Surat, Vadodara, Gandhinagar, Rajkot, and Dahod) have Integrated Control and Command Centers (ICCC) for pan-city surveillance and IT services.
- **AMC Sewa App:** Allows Ahmedabad citizens to report issues, access municipal services, and find local amenities.

Innovation and Incubation Centre in Surat: This centre promotes growth, entrepreneurship, and investment, with facilities like co-working spaces, teaching labs, and mentorship programs. Thirty-five startups were incubated, and 59 events and 51 webinars were organised.

Other IT-based services in ULBs

- **Janmitra Wi-Fi:** Provides free unlimited 2 Mbps Wi-Fi in public places. By December 2022, 38 lakh unique users had consumed 46 PB of data. The average daily usage includes 2,500 users with 2 TB of data consumption.
- These initiatives illustrate how digital innovations reshape urban governance, making cities more efficient and citizen-friendly.

How does the department measure the impact of its urban development projects on residents' quality of life?

The Urban Development Department is actively working to improve public services and residents' quality of life through various initiatives and programs. Key efforts include:

Water Supply and Wastewater Management

- **Nal Se Jal Program:** This initiative focuses on expanding water supply systems to ensure access to clean water for all. Concurrently, efforts are being made to manage and measure wastewater reuse effectively.
- **National Clean Air Program (NCAP):** Aims to improve air quality across cities through various local programs and initiatives that enhance open spaces, contributing to better urban livability.

Infrastructure and Housing

- **Pradhan Mantri Awas Yojana (PMAY):** Provides affordable housing to urban residents, addressing the need for quality housing.
- **Swarnim Jayanti Mukhyamantri Shahari Vikas Yojana (SJMMSVY):** This scheme focuses on physical infrastructure development, including roads, water lines, and streetlights, with contributions from state, private, and local bodies.

Public Feedback and IT Solutions

- **e-Nagar Portal:** A user-friendly platform allowing citizens to access municipal services and raise complaints, enhancing public engagement.
- **Janmitra Wi-Fi:** Provides free 2 Mbps Wi-Fi in public spaces, enabling residents to access online services and share feedback. As of December 2022, the service has had 38 lakh unique users and consumed 46 PB of data.
- **PRANA Portal:** Monitors air quality and the implementation of the NCAP, providing updates on air quality management efforts.

Public Participation Initiatives

- **Swarnim Jayanti Mukhyamantri Shahari Vikas Yojana:** Grants allocated in a 70:20:10 ratio (State government: Private entity: Urban local body) support various development works. Over the past five years, 12,528 projects worth Rs. 784.87 crore have been sanctioned.
- **Jal Diwali Campaign:** Organized by the Ministry of Housing and Urban Affairs (MoHUA) under AMRUT 2.0, this initiative, held from November 7-9, 2023, involved women from Self Help Groups (SHGs) visiting Water Treatment Plants (WTPs) to understand water supply processes and quality testing. In Gujarat, 2,100 women from 56 ULBs visited 91 WTPs.

AMRUT Mitra

- **AMRUT Mitra:** Aims to involve SHGs in various infrastructure projects, including water and sewage treatment. With a budget of 150 crore, this initiative supports projects ranging from 2 lakh to 10 lakh. Forty-seven projects worth Rs 303.62 crore have been approved across 27 ULBs.

Sanitation and Cleanliness

- **Swachh Bharat Mission 2.0 and Nirmal Gujarat 2.0:** Focus on improving sanitation and cleanliness. These programs include building more toilets, enhancing waste management, and promoting hygiene through campaigns and interactive feedback mechanisms. Continuous surveys and the Swachhta app help monitor progress and guide future activities.

These initiatives reflect a comprehensive approach to urban development, enhancing public services, infrastructure, and citizen engagement while promoting sustainability and inclusivity.

Numerous activities related to 'Janbhagidari' and feedback consultations were executed under Swachh Bharat Mission 2.0 and Nirmal Gujarat 2.0 initiatives in Gujarat. Various programs, campaigns and city-wise activities and achievements are listed below.

Activities performed under SBM 2.0.

Sr. No.	Activity	No. of People participated
1	Swachhata Hi Sewa Campaigns	85,75,380
2	Safai Apnao Bimaari Bhagao Campaign	2,560
	Total	85,77,940

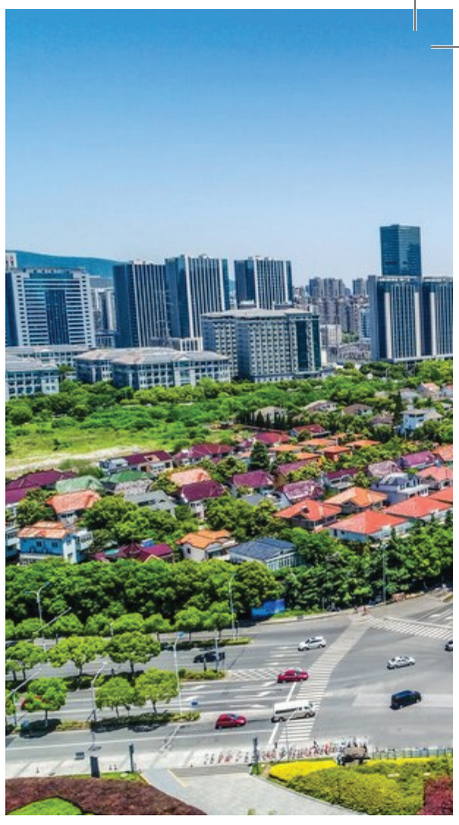
Activities performed under Nirmal Gujarat 2.0

Sr. No.	Activity	No. of People participated
1	Cleaning of Aspirational Public Toilet	4400
2	Cleaning of Bus, Railways & Taxi stand	100
3	Cleaning of Civil hospitals, government hospitals, PHCs, CHCs, UHCs, Anganwadi's, and private hospitals	13246
4	Cleaning campaign at all entry points of ULB	20220
5	Cleaning of Fly overs, under bridges, bus stands, railway stands, rickshaw/taxi stands	11121
6	Government offices in urban areas are cleaned, records sorted, scrap disposed of, and old vehicles auctioned.	9840
7	Cleaning of Open plots, plains, standard plots of society, and slum areas	12768
8	People participated in Tree Plantation	2506
9	Cleaning of Public and community toilets	8551
10	Cleaning of Public roads, main roads, all malls, market areas	16847
11	Cleaning of Religious places, museums, tourist spots, heritage buildings, archaeological sites	17957
12	Cleaning of Rivers, lakes, water sources, beach cleaning, cleaning of drinking water overhead tanks, filtration plants	13098
13	Cleaning of Statues, gardens, parks, government residential estates	11403
14	Cleaning of the Vegetable market, APMC, orchards and wet waste composting facility.	920
15	Waste sorting drives	23333
16	World Environment Day	24720
	Total	**1,91,030**

Awareness generation campaign on Single Use Plastic (SUP)

Sr. No.	Activity	Quantity of plastic seized	No. of People participated
1	Awareness Generation and SUP Ban	333.01 Kgs	24,000
	Total	333.01 Kgs	

*(MC's-144.73+RCM's-188.28)



Gurugram's Pioneering Efforts Towards Eco-City Transformation

Subhash Yadav, IFS
Additional Chief Executive Officer (Environment)

Gurugram is paving the way towards a greener future, with citizens and authorities collaborating to fulfil the environmental requirements of the IT hubConsistent efforts are made not just to create but restore the city's environmental fraction. Different partnership models are being introduced to get hands from all the different sections to participate in these initiatives.

'I am Gurgaon' is one such movement in which the authorities of Gurugram and citizens have joined hands to move towards a greener future for Gurugram. The movement is being supported by government agencies such as:

- Gurugram Metropolitan Development Authority (GMDA)
- Haryana Forest Department
- Municipal Corporation of Gurugram (MCG)

Their team comprising of -
160 maalis
Supervisors
Project Managers
Project Leads and many others' collaboration has led to the recreation of green habitats to revive ecosystems, manage water resources, and mitigate urban flooding. In addition, the team has created forest corridors that offer safe, green, non-motorised transportation options, ensuring equitable access to all.
The 'Partnership Models' coming together for the creation of an ecosystem fostering green initiatives are:

- Residents and Citizens
- Academic Institutions
- Individual Contributors
- Government Agencies
- Corporate Agencies
- Corporate Partners
- Other NGOs

A survey revealed that out of 826 water bodies in the district, 153 are beyond revival, while many others are under threat due to encroachments and pollution. The GMDA's efforts aim to map and restore these water bodies, addressing issues such as sewage discharge and solid waste dumping.

'I am Gurgaon' boasts highly successful projects transforming the targeted area. It has created green habitats in barren areas.

Sikanderpur Pahadi Project

Initiated in 2019, this project focuses on rejuvenating a neglected 90-acre area comprising a forest and a water body. The main objective is to transform this underutilised site into a vibrant green space that significantly contributes to the city's environmental sustainability. By restoring the natural habitat and enhancing the ecosystem, the project aims to create a flourishing environment that benefits both the community and local wildlife, promoting biodiversity and ecological balance.

Project objectives were:

- To revive the area as an urban forest, integrating it into the city's larger greening vision
- Increase urban green cover by planting native species.
- Make the space usable for residents by cleaning and improving the accessibility.
- Promote alternative mobility through the creation of walking and cycling tracks.
- Restore pond and stormwater channels to revive the water system and prevent city flooding.
- Create an ecosystem supporting diverse flora and fauna, animals, birds and insects.

Chakkarpur Wazirabad Bundh Project

This initiative has successfully converted a 5.2 km crucial mobility corridor into a significant urban asset, fostering community engagement, environmental sustainability, and local livelihood opportunities. The transformation has made the corridor a central part of urban life, encouraging residents to participate actively in community activities. Additionally, the project has contributed to environmental health by integrating green spaces and sustainable practices while also creating economic benefits for local businesses and individuals through improved access and increased foot traffic.

Project Objectives were:

- Increase urban green cover by planting native species.

- Promote alternative mobility by creating walking and cycling tracks.
- Restore stormwater channels to revive the water system and prevent city flooding.
- Create an ecosystem to support diverse flora, fauna, animals, birds, and insects.
- Facilitate interaction and engagement among diverse community members.

- Serve as a carbon sink.

Badshahpur Forest Corridor

The Badshahpur Forest Corridor Project, initiated in 2018, aims to transform a wasteland into a dynamic, resource-efficient, and ecologically rich community resource. Spanning 5.6 km, this urban greenway connects the Southern Peripheral Road (SPR) to National Highway (NH) 8, passing through diverse neighbourhoods, including gated communities, low-income housing, institutions, and urban villages. The corridor features walking, jogging, cycling trails, and rest areas, promoting natural ecosystem habitats and human health. The project emphasises social sustainability by creating spaces for community gatherings, contemplation, and inclusive play areas. It incorporates nature-based solutions for stormwater management, groundwater recharge, and native species plantation, making it a zero-discharge site that diverts waste from landfills and enhances biodiversity. The final 2.2 km stretches, completed in 2023, have further reinforced the corridor's role as a vital urban asset and safe mobility corridor for the residents of Gurugram.

Eco Restoration of Aravalli Creek 56

The Eco Restoration of Aravalli Creek 56 project aims to establish a 3.5 km long urban forest trail through Sector 56, Gurugram. Beginning at the base of the Aravalli ridge at Ghata and extending to Rajesh Pilot Marg/Golf Course Extension Road, this 55-acre stretch is surrounded by gated housing enclaves. Historically, as a stormwater runoff and water retention area, the creek has become an open greywater/sewage creek due to neglect and encroachment. The project focuses on ecological improvement, including native species plantation, waste management, and creating an accessible public space. It aims to restore local biodiversity, promote environmental education, and provide a sustainable urban mobility corridor for walking and cycling.

Apart from this, Gurugram has seen significant efforts to restore and revive its water bodies in recent years.

Sanpka Pond Project

The Environmentalist Foundation of India (E.F.I), with support from the Haryana Government and HDB Financial Services, undertook this project. It involved cleaning up the pond, removing invasive weeds, strengthening embankments, and preventing sewage inflow.

Damdama Lake in Sohna

It is another significant restoration effort, as the lake has shrunk considerably. Restoration efforts are focused on expanding the lake bed and improving water quality to support local biodiversity and tourism.

Additionally, the Gurugram Metropolitan Development Authority (GMDA) has identified several water bodies for restoration. A survey revealed that out of 826 water bodies in the district, 153 are beyond revival, while many others are under threat due to encroachments and pollution. The GMDA's efforts aim to map and restore these water bodies, addressing issues such as sewage discharge and solid waste dumping

These initiatives are crucial for replenishing groundwater levels, supporting local ecosystems, and providing recreational spaces for the community. The restored water bodies also significantly mitigate urban flooding and improve the region's overall environmental health.

*Views expressed by **Subhash Yadav IFS**, ACEO (Environment), Gurugram*

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GIS-Based Dynamic City Information System and Development Index

Cities are increasingly recognised, graded, and ranked based on the scale of services their administration provides to end users. With various digital tools backed by the computing power offered by technology, using spatial and attribute data to extend services based on logical analytics has become possible. While this technical know-how is available, there is a skill divide among administrative teams, IT solution providers, and planners. This leads to a situation where what planners visualise needs to be fully translated into operational initiatives, and the end-users expectations from services are left unaddressed. Cities will become smart when services are delivered per end-user expectations and viable for the provider. The maturity of such services, in turn, defines the city rankings in real terms.

This paper outlines the potential linkages among spatial and attribute data sets and presents an approach for using Geographic Information System (GIS) to formulate avenues for providing information and services to end users. The content also provides a potential approach for using this information to achieve real-time comparisons among city areas based on user-defined criteria.

Automation in service delivery has opened several avenues for planners to conduct fact-based and location-specific analyses to arrive at service solutions. Such analysis helps create area-based plans and makes forecasts more meaningful since they are based on trends of past events. With the availability of mechanisms to document development parameters as they happen, the metadata for these events becomes an effective tool for providing specific information sets for users, administrators, and decision-makers to dovetail the plans and strategies for implementation. GIS tools and application interfaces have the potential to provide information indicators on the maturity of services using defined analytics to arrive at the ranking parameters for city areas.

Current Situation

As part of digital service provision initiatives, several programs are underway worldwide. Some yearly yardstick reports rank cities based on specific parameters like cleanliness, health facilities, etc. These ranks are mainly based on the extent of joint program implementation, citizen perception, percentage of spend, etc. While consultants and administrators drive this, the end user or citizen often needs help understanding the actual value of implementation to them. At the end of the process, this customer of service is usually satisfied with the quality of service.

Assessing The Need For Solutions

The purpose of the City Index/Ranking is to provide a reference parameter for end users to make informed decisions based on parameters of their choice. Spatial solutions need to provide a way for users to select parameters of their choice. At the same time, overall city indexes must also be based on spatial data and information from selected databases. Commonly used applications like Google Maps/MapMyIndia and a few others available in digital format need to be used to form a combined format on which a dynamic ranking of areas can be built and scaled up to the city level. Considering the above, there is a need for a channel to supplement the provider information to the end user for meaningful interpretation. The following vital parameters form the basis for this channel:

- End users or customers of service, i.e., citizens, get a chance to contribute with their piece of information. Currently, there are channels where users can input spatial data and attribute information. Such data from spatial information mapped or updated by citizens must be used through logical processing.
- The city-level information from the administration on infrastructure and services needs to be integrated.
- Appropriate analytics are required to aggregate the figures.
- A standard output needs to be agreed upon to display results for consumption by all stakeholders.

The service benchmarking or city ranking with real-time processing of information captured and processed as above shall depict more meaningful and near-to-reality results. The subsequent sections of this chapter intend to outline the path for the same.

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Elements of City Information Systems

In today's digital age, we rely heavily on digital tools for everyday activities. These tools not only provide a variety of options but also track changes on the ground. Many city functions have shifted to digital mode, and technological advancements have introduced interfaces among digital databases, both spatial and numerical. It is essential to leverage this synergy to logically group information and facilitate information exchange among providers for meaningful results. Such an approach will enable informed decision-making and enhance governance and planning. The service landscape of a city depends on the following broad categories of needs:

- **Category 1 -** Networked Infrastructure services like road, water, power, transport, etc.
- **Category 2 -** Social Infrastructure services like educational institutes, commercial areas, marketplaces, hospitals, care centres, places of worship, parks and recreation spaces.
- **Category 3 -** Other services like office spaces, industrial areas, etc.
- **Category 4 -** Citizen attributes along with land, ownership information, etc.

Land	Mapping of Land Parcels Linking Land parcel information with ownership details Mapping Land parcel with prescribed usage Classification of Land parcels as developed as per service availability
Building	Linkage to land ownership for building permission Water / Power/Sewage availability for the proposed development Permissible construction type , sub owner details etc
Citizen	Identity Linkages to ownership Right over land & building Owner / Co owner / Tenant / Sub owner details
Services	Capacity utilization & Balance Service Potential in Land Pockets Infrastructure short fall assessment & provision
Infrastructure	Extent of Provision of Open spaces / Walk areas / Cycle tracks Extent of availability of Health care / Diagnostic facilities / Schools / Colleges / Transport Area development Index inputs
Administration	Trend in land values & Buildings deals Built-up & Human Density assessment Extent of Solar power & rain water harvesting

Listing Datasets

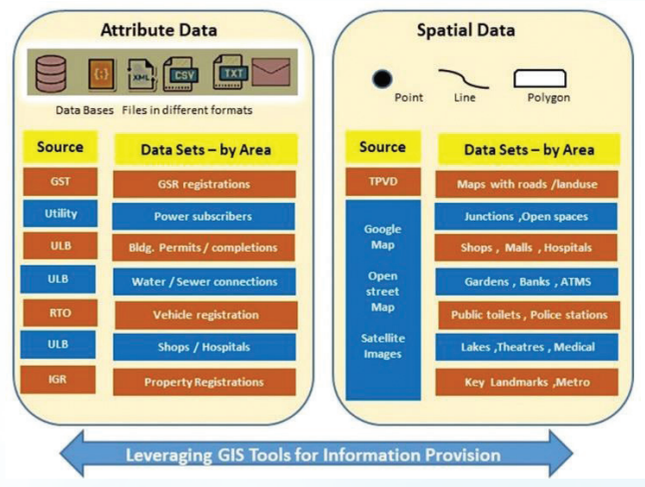
City rankings should be based on physical and socio-economic parameters. Various datasets from different departments within a city's jurisdiction must be centrally converged and accessible. Some of these datasets include:

A. Digital Databases

- **Economic Activity:** GST registration details of business outlets by city are classified by pin code.
- **Transaction Data:** All entities are classified by state, city, and locality.
- **ULB Budget Information:** Includes funds (own/grants/ loans) and expenditure details.
- **Registration Details:** For schools, shops, hospitals, etc., from ULB databases.
- **Consumer Data:** For water, power, and sewer connections from provider agencies.
- **Master Plan Information:** Spend details for footpaths and roads.
- **Service Data:** Information on services provided in manual and digital modes.
- **Location Lists:** Banks, ATMs, public toilets, parks, etc.
- **Public Transport Data:** Ticket sale data for buses and metro.
- **Connectivity Data:** Air and rail timetables for city connectivity.
- Solid Waste Collection Data
- Rainwater Harvesting and Solar Installation Data

B. Spatial Databases

- **Satellite Imageries:** From sources like Bhuvan (Bhukosh) and Landsat, available at nominal fees.
- **Shape Files/Maps:** From ULB for master plans and ward divisions, usable in open-source GIS software.
- **Commercial Spatial Data:** Google Maps, Open Street Maps, and Map My India data are available for purchase.



Avenues For Analysis Using GIS

Various GIS tools are available for spatial analysis, where information from multiple datasets can be pooled to build analytics. Such analytics are helpful for administrators and end users in their decision-making. Some of the avenues for such analysis are listed below:

- With the mapping of roads, the authority can gauge the extent of infrastructure reach to the last pocket of land.
- The trend of land sale data helps identify the direction of interest areas for end users and plan infrastructure on the ground to give the land parcels a developed status.
- Citizens' decisions can be influenced when authorities' plans for infrastructure expansions are seen on interactive maps, which show land parcels likely to be served by infrastructure.

In existing areas, built-up structures and additions/alterations can be tracked using satellite imagery. Information on building permissions/completions from municipal datasets makes queries customisable for logical interpretation of results.

Using datasets in sync with spatial data, information on areas with infrastructure availability, structures with clear titles, water/power/sewer connections, etc., can be highlighted with a click of a button, ensuring information security. Authorities can extend this service to citizens through a subscription-based digital service.

Guiding Principles For Building The Datasets

The datasets in service-providing departments within an urban local body are complex, and the interrelationships among these datasets are key for spatial analysis, required for making information available in a simplified format. To create meaningful analyses and provide users with parameters to choose from, the tools must be configurable for extracting information. The typical questions from users and administrators help IT professionals build database queries for the intended results. Some of these questions are:

For citizens

- Which areas should you choose to buy a house in?
- Explore options for schools/healthcare facilities for the family.
- Locations accessible by public transport and availability of amenities.
- The extent to which infrastructure facilities like roads, water, power, open spaces, shops, and banks are available.
- Identification of potential land pockets where infrastructure extensions are planned by authorities.

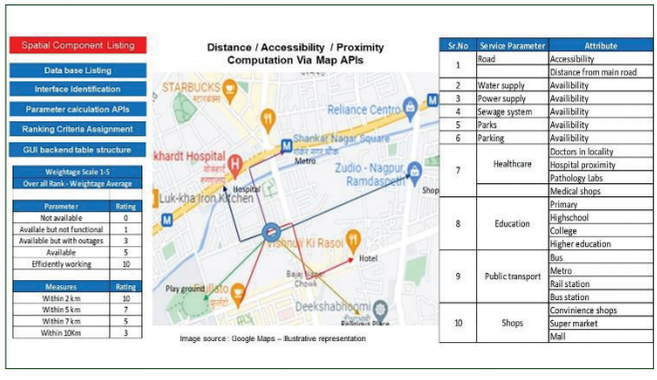
For authorities

- Indicators of economic activity within their jurisdiction to identify commercially active zones.
- Availability of amenities like parking in commercial areas.
- Concentration of properties let on rent in localities and building permissions in various areas.
- Vehicle concentration in areas concerning vehicle registrations.
- Popular areas for using metro/shopping/sales of different commodities.

To provide answers to such questions, IT tools have untapped potential that cities are waiting to explore. The website of the Singapore Redevelopment Authority is an example of a place where interactive maps allow users to explore various information sets within Singapore, making information readily available. Presenting information based on analytics can help develop rankings of areas based on multiple parameters.

These parameters are configurable according to an agreed set of baseline rules, such as:

- Availability of the service, and if available, at what distance from the user's preferred location.
- The weightage assigned to the importance of the service as user preferences vary.
- Instances of accessibility to infrastructure like roads, metro, bus routes, along with social infrastructure like parks, schools, shops, hospitals, etc. Rating assigned based on distance criteria.
- Results displayed on parameters computed in sync with the ratings.



Weightage Scale 1-5 Over all Rank - Weightage Average	
Parameter	Rating
Not available	0
Available but not functional	1
Available but with outages	3
Available	5
Efficiently working	10
Measures	Rating
Within 2 km	10
Within 5 km	7
Within 7 km	5
Within 10Km	3

Sr.No	Service Parameter	Attribute
1	Road	Accessibility
		Distance from main road
2	Water supply	Availibility
3	Power supply	Availibility
4	Sewage system	Availibility
5	Parks	Availibility
6	Parking	Availibility
7	Healthcare	Doctors in locality
		Hospital proximity
		Pathology Labs
		Medical shops
8	Education	Primary
		Highschool
		College
		Higher education
9	Public transport	Bus
		Metro
		Rail station
		Bus station
10	Shops	Convinience shops
		Super market
		Mall

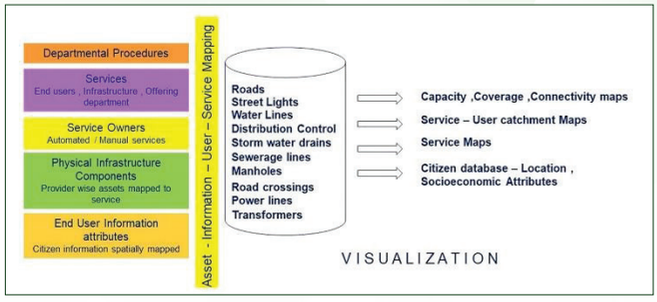
Visualisation Of Data Components – City Information Database (CIDB)

The information needed to validate service inputs is an important aspect of the process. The linkage is established through mapping parameters and the availability of these through IT-enabled service solutions, forming a repository called the City Information Database (CIDB). The different agencies instrumental in service provision gather information specific to individual offerings. Such information is being documented systematically through the process automation carried out under various IT initiatives over the last two decades. As such, it has strong potential to bring a catalytic effect to information exchange and enable service provision. It shall bring much-needed acceleration in the service provision mechanism, which is the primary intent of all IT initiatives.

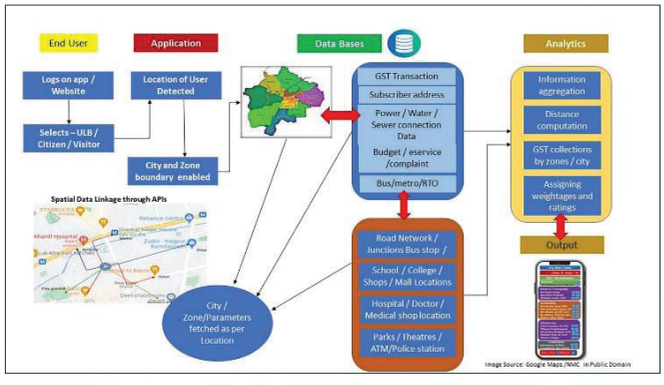
In the context of urban services, conceptualising CIDB components like infrastructure mapping, geo-referencing of assets, data inventory, and user information-based parameters of existing services becomes a prerequisite for meeting the objectives of CIDB. The CIDB repository aims to establish the linkage between spatial and service information datasets for user-specific queries.

GIS Solutions And Ranking System Evolution

GIS packages offer options for structuring the query results based on user input parameters and the planned decision-making criteria. The IT solutions teams are expected to perform the tasks below to help users get the intended information. These tasks are based on the datasets listed above and the intent of the computations.



- Use APIs from spatial tools to compute the counts/ distances of various physical and social infrastructure parameters.
- Information of a statistical nature to compute the display parameters depicted in intended result displays (refer to presentation GUI Illustration).
- Algorithms to process data and populate tables as per the user in question.
- Display the results per the agreed criteria for counts and weightage score of each parameter.
- The information classified according to user criteria is to be tabulated to suit the display designed for viewing by the end user.



The Graphical User Interface (GUI) depicted in Figure 5 needs to be supported with spatial and numerical figures. As such, the first stage majorly comprises the following activities:

- Identification of key stakeholder departments.
- Listing of parameters and their mapping to stakeholder departments.
- Establishing the linkages among datasets.
- Spatial data identification for Application Interfaces.
- Base data sources for spatial information are Bhuvan, Google Maps, Open Street Maps, etc.
- Nodal agency finalisation.
- Consensus on computation aspects – Parameter rating criteria, weightings, analytics for weighted averages, and ranking criteria.

Features of the GIS-Based Ranking

The GIS-based rankings have key differentiators, as listed below. These will give citizens a unique experience, allowing them to compare city areas based on user-selected parameters.

- Users can view the development index of their areas of interest according to their chosen priority parameters.
- Authorities can view the rankings of their administrative areas based on the percentage of areas/wards with index values on a scale of 1-10, with the city classified as Class A/B/C, etc.
- The rankings automatically refresh with changes on the ground, reflecting improved or reduced index values.
- Rankings can be system-driven at fixed intervals, while users can see real-time updates based on ground changes or specific user locations.
- There will be no need to conduct yearly surveys, saving effort and expenditure for city governments.
- The rankings are real-time, readily available, and can be published at national, state, and local levels.

Conclusion and Implementation Path

The maturity of services is directly related to the ranking of cities. The end-user perspective also defines these rankings, as cities need to be perceived as "smart" from the users' perspective. End-user satisfaction thus becomes a key element in recognising a city as a Smart City. There is a need to realign IT initiatives to provide a perceptual view of our cities.

Once scaled up, the approach to GIS-based city rankings should be visualised as a national-level initiative. However, information parameter standardisation across cities and states is necessary to scale up the solution. Initially, such an initiative should be trialled at a single city level, with parameter ranking based on the geographical division of the city, i.e., zones/wards.

Views expressed by: **Dr Praful Gharpure**, *Sr Consultant - Infrastructure Planning and Development, Tata Consultancy Series, Nagpur*

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Groundbreaking Water Management Practices in Gurugram

Srishti Verma | Elets News Networks (ENN)

Gurugram's emergence as IT Hub has given way to its rapid urbanisation and exponential rise in population. With that rise, the requirement for water has increased as people need it in every part of their day-to-day functioning. To meet the daily water requirements of Gurugram's population, the Municipal Corporation of Gurugram (MCG) makes consistent efforts in water management and rainwater harvesting.

A Budget of Rs. 2887.32 crore was cleared for FY 2024-25 to improve the water treatment capacity and increase the sewage treatment capacity in the city.

According to data from the Gurugram Metropolitan Development Authority (GMDA), 400 million litres of water is required in Gurugram daily. Innovative water conservation plans are introduced in the city for the complete utilisation of resources like:

Digital Monitoring of Groundwater Levels: Being a landlocked city, groundwater is the primary water source for the Millenium City of Gurugram. Hence, monitoring of groundwater becomes critical. To ensure that 134 automatic piezometers will be installed across the city to monitor groundwater levels continuously at a distance of 5 km from various government buildings. It will be linked to GMDA's Integrated Command and Control Centre (ICCC), allowing for the availability of real-time data collection.

Funds Allocation: The authority proposed 13 new infrastructure projects in the recently convened 13th meeting of the GMDA. Also, a budget of Rs. 2887.32 crore was cleared for FY 2024-25, according to the data provided by MCG. The latest projects are targeted at improving the water treatment capacity and increasing the sewage treatment capacity in the city. Apart from this, this budget will also cover upgrading roads and other basic amenities in the city.

Street Level Rainwater Harvesting: Rainwater harvesting conventionally requires a lot of open space to collect fresh water. However, the Municipal Corporation of Gurugram has developed an innovative and eco-friendly model for street-level rainwater harvesting along a road. The system taps the surplus rainwater and recharges the groundwater table. It also addressed the issue of waterlogging on the street as a bonus. As per the data from MCG, the capacity of this street-level rainwater harvesting pit is 72,000 litres. The pipes installed in the system can drain 2,500 litres of water in one hour, making it a highly efficient rainwater harvesting system.

Sewage Water Treament Plant

The Municipal Corporation of Gurugram has developed an innovative and eco-friendly model of street-level rainwater harvesting along a road. The system tapas the surplus rainwater and recharges the groundwater table.

Apart from new initiatives, Gurugram Authorities are also considering improving the existing infrastructure. GMDA is all set to lay a 20.5-kilometre master supply pipeline from the Basai water treatment plant to the city's tail-end areas, providing a better water supply to every part of the city. MCG regularly carries out round-ups to further examine the scope of improvement in Gurugram's water management system.

To tackle the rising water logging concerns in the city, MCG and GMDA even joined hands. Also, meetings are held to resolve the emerging issue quickly. This indicates that the city is learning and growing as it evolves with time, which many other cities in the nation need to learn.

Levelling Up Waste Management in Gurugram

Srishti Verma | Elets News Networks (ENN)

The 'Millenium City' of India - Gurugram has seen an exponential rise in population in the past decade since the wave of 'Corporatisation' hit the earlier agrarian city. And with this increase in population comes an equivalent increase in waste generation. According to the data of Municipal Corporation of Gurugram (MCG) 800 tonnes of waste is generated in Gurugram daily. The MCG has played an active and efficient role in keeping the city clean and managing the heaps of waste generated owing to the well-defined and sophisticated process laid out by the MCG.

Door-to-door waste collection: Waste is collected from every household through door-to-door service through third-party agencies. However, recently MCG has proposed to take complete control of the waste collection. It will introduce user charges into property tax bills or engage banks in respective wards to collect

the charge. Also, MCG is planning to finance the purchase of electric vehicles for unemployed youth and ragpickers, which can be used for waste collection.

Waste Processing: The MCG operates five composting plants that convert wet waste into compost. Additionally, numerous composting facilities have been transferred to Residents' Welfare Associations (RWAs), now managed by local communities. Many private colonies and societies have embraced source segregation and composting as best practices. The primary composting methods used throughout the city include

- Pit Composting
- In-Vessel Composting
- Organic Waste Composters.

Disposal: As of now, the dry waste is dumped into the Bandhwari landfill. But to address this pressing issue, MCG has constituted a special committee which is working on several initiatives - both long-term and short-term, which can help in the reduction of waste that lands in the landfill. Also, the 'Integrated Solid Waste Management Project' is coming into force which will bring the best out of waste by converting it into power by 2024.

MCG has constituted a special committee which is working on several initiatives - both long-term and short-term, which can help in the reduction of waste that lands in the landfill.

MCG has been persistent in its efforts to keep the Millennium City spotless. They are not just looking to clear and process the waste generated but also look for the root cause of waste generation. The corporation recently identified more than 3,000 Bulk Waste Generators (BWGs) in commercial and institutional categories across the city.

Despite such precision in planning and execution, the city needs help in keeping up with cleanliness and waste management. MCG has been persistent in its efforts to keep the Millennium City spotless. Recently, it was discovered that waste was transported from Delhi in odd hours, which adds to the already heavy load of waste management on Gurugram Municipal Corporation. Though, at least 20 vehicles have been penalised for the offence, but the problem remains.

Strict legislative rules are laid under Solid Waste Management Rules 2016 for the proper disposal of waste. This includes segregating wet, dry and domestic hazardous waste and disposing of it properly. In addition to this, MCG has set up a registration portal and empanelled expert agencies to assist with waste disposal. Fines are imposed in case of non-compliance and robust actions are taken against the defaulter.

With consistent effort and digitisation into the waste management sector, Millenium City can be seen as the IT hub and the hygiene spot to set up the industries.

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Smart City Chandigarh

Municipal Corporation Chandigarh

Knowledge Partner

INNOVATING FOR FUTURE CITIES

EVENT REPORT

Event Report

INAUGURAL SESSION

The Elets National Urban Innovation Summit was conducted on 14th December, 2023 at The LaLiT Chandigarh, supported by Canara Bank in collaboration with Elets Technomedia. The summit aimed to bring together thought leaders, experts, innovators, and stakeholders from the urban development sector to explore and showcase innovative solutions that can transform our cities into smarter, more sustainable, and inclusive urban spaces. The summit was centred around 'Sustainable Urban Development' where the role of technology in Urban Governance was discussed.

The Summit witnessed prominent policy makers who are involved in innovation that leads to the successful development of Smart City. The thought leaders addressed the Summit to deliver insights on variety of topics like Sustainable Urban Development, Role of technology in Urban Governance, sustaining food & art culture.

In the key note address, Anindita Mitra, CEO, Chandigarh Smart City Limited & Commissioner, Chandigarh Municipal Corporation reflected upon the efforts that have been made by Chandigarh authorities which made it possible to make the Union Territory Smart City. She discussed about the crucial issues like water management and need for sustainable practices like Public-Private Partnerships (PPP).

Followed by the keynote address, the Chief Guest, Shri Anup Gupta, Hon'ble Mayor of Chandigarh Administration launched the Special Issue of eGov Magazine. He addressed the audience on water management goals of the city. Also, he explained waste management progress that the city has made over the years. Taking the discussion further, our Chief Guest talked about the smart city initiatives, including ICT centers, traffic management systems, and SCADA management.

In subsequent series of events, Ganesh Kandaswamy, SFC Technologies, Integrated Solid Waste Management of Goa gave details on SFC Technologies and its working. His address primarily explained about the plants being run by the organisation and the amount of power generated by the same.

Further, the panels discussed different engaging topics which revolved around the Urban Innovation scenario. The arguments were regarding waste management, sanitation, and water management. In totality, the deliberations were related to Urban transformation.

The 4th Elets Urban Innovation Summit served a platform for dissemination of ideas and plans for development for cities. Smart City development was the prime discussion matter that summarised the Summit.

Keynote Speaker

ANINDITA MITRA

CEO, Chandigarh Smart City Limited & Commissioner, Chandigarh Municipal Corporation

- The prime goal behind a smart city has to make the lives of the citizens easier, putting forward projects which are actually sustainable.
- People should try to cut down their waste generation. There should not be any unnecessary waste generation and over utilisation of scarce resources like water.
- Chandigarh Municipal Corporation, in last one year has identified each and every gap in the system irrespective of the size of the gap. Hence, the department is optimising the resources whatsoever provided to them.
- Chandigarh city wastes 35 per cent water while the national average stands at 15 per cent. This is the case when the city has water for eight hours per day.
- The wastage of water tends to go down if the availability of water is 24x7 as the demand for the same decreases with the increase in availability.

Industry Presentation

NAMITA SOLANKI

Head of Delivery Smart Spaces, Hitachi

- Bengaluru has evolved through phases: Society 1, Society 2, Society 3, and is currently in Society 4.0.
- The city aims to achieve Society 5.0 by 2050 which will be much more intelligent, technologically enabled, and proactive
- An Intelligent Water System will use Smart Meters to gather data for efficient water management.
- Components of a cognitive city emphasize a proactive approach, human-centric design, and integration of IoT devices and data from various departments.
- Intelligent water systems are crucial for managing water resources efficiently, they help to reduce water leakage. Also they address challenges posed by climate change and market pressures.

Chief Guest

SHRI ANUP GUPTA

Hon'ble Mayor, Chandigarh Administration

- Chandigarh is described as a city born smart due to its well-planned infrastructure and systems since its inception as the first planned city in independent India.
- Chandigarh aims to achieve 24x7 water management within the next two years and has received national recognition for its exemplary water management practices.
- Significant progress has been made in waste management, with 100% processing of dry, wet, and sanitary waste across all sectors of the city.
- Various smart city initiatives, including ICT centers, traffic management systems, and SCADA management, have been implemented, reducing accidents, congestion, and fuel consumption.
- Worker welfare programs include free insurance coverage for accidental and death benefits for all workers, including regular, contractual, and daily wage employees.
- Chandigarh emphasizes the principles of reduce, recycle, and reuse in its waste management efforts to create a cleaner and greener city.

Policy Perpective

DR. RAMAKANT

Deputy Advisor, Ministry of Housing and Urban Affairs, Government of India

- By 2040, 167 countries, including India, China, Australia, and the USA, may face a severe water crisis, with 33 countries reaching critical levels.
- 54% of India's surface water is categorized as high to extremely high stress, and 54% of groundwater levels are depleting due to over extraction and uncontrolled withdrawal.
- Over 100 million people in India, particularly in states like West Bengal and Punjab, are affected by poor water quality due to contamination.
- India's water supply averages 2.3 hours per day, leading to contamination risks and inequitable distribution. High non-revenue water loss and intermittent supply exacerbate challenges.
- India ranks poorly in water quality, placing 120th among 122 countries in the water quality index. Several Indian cities, including Delhi, face significant water quality issues.
- A manual on water supply and treatment is being revised to incorporate new components, such as ICT surveillance and SCADA systems, to ensure safe and continuous water supply.

GANESH KANDASWAMY

SFC Technologies, Integrated Solid Waste Management – Goa

- SFC Technologies is running two plants in Goa, one with a 300-ton capacity since 2016 and another with a 100-ton capacity in operation for the last two years.The two plants generate and export power to the Government of Goa.
- The plants generate 32,000 units of power daily, with 12,000 units consumed on-site.1.5 Megawatts of power are generated per 100 tons of waste.
- SFC Technologies has 1200 sewage treatment plants (STPs) across India and has ventured into municipal solid waste (MSW) management through their subsidiary, Hindustan Waste Treatment.
- Performance parameters include recycling various fractions of waste, generating power and compost, and minimal waste going to the landfill (3-4%).
- Plant operations are controlled through a single-point control system using a PLC (Programmable Logic Controller) to monitor parameters and take corrective measures.

Case Study

Panel Discussion - 1

RESHAPING URBAN LANDSCAPES- INNOVATIONS IN WASTE MANAGEMENT & SANITATION FOR CLEANER FUTURE

PROF NARSINGRAOPYARASANI

Founder & CEO, Urban Development Research & Training Institute, Hyderabad

- Urban Development Research & Training Institute focuses on training municipal corporation employees in various subjects related to effective administration, water supply systems, engineering systems, and more.
- The core area of the institute is training municipal corporation employees to achieve effective governance and increase revenue without raising tariffs.
- There is scarcity of land and the need for land reclamation to meet housing requirements and improve the city's infrastructure and culture.
- There are three types of lands: basic land, mountain land, and lands near rivers. Reclaiming vacant lands for development has become important in recent times.
- Bringing vacant lands into developed areas to fulfill the government's "Housing for All" initiative and addressing the challenges of future housing requirements.

Panel Discussion - 1

HARGUNJIT KAUR

Special Secretary, Department of Finance, Chandigarh Administration

- Chandigarh's financial resources adequately meet the city's demands, with no significant incidents of financial resource shortage hindering project execution.
- There is pressing need for retrofitting and rehauling aging infrastructure, like sewage and water supply systems, which often incur higher costs compared to greenfield projects.
- Recovering costs for municipal services is crucial like water supply to justify further funding from the central government and ensuring sustainability.
- The need of the hour is of public and private sector participation in waste management and sanitation infrastructure, including exploring low-cost, high-impact technology solutions and potential PPP models.
- Startups and innovative solutions play a crucial role in addressing challenges like waste management and water conservation, with the government showing enthusiasm for supporting such initiatives.

DR. RAMAKANT

Deputy Advisor, Ministry of Housing and Urban Affairs, Government of India

- 1,367 Detailed Project Reports (DPRs) are under preparation for water rejuvenation, with around 1,300 already approved at a cost of approximately 2,000 crores. This demonstrates the commitment to improving water infrastructure and quality.
- Around 70 projects are approved for recycling and reuse of wastewater at city and state levels, indicating a focus on sustainable water management practices.
- 333 sewage projects were approved at a cost of about 30,000 crores, highlighting efforts to improve sanitation and wastewater treatment infrastructure.
- An integrated approach to water management, including mapping groundwater resources, to ensure a sustainable and reliable water supply is implemented.
- Pilot India program provides financial support to Indian startup companies, with an award given to 75 startups last year. This indicates a focus on fostering innovation and entrepreneurship in water management and related sectors.

Panel Discussion - 1

Panel Discussion - 1

NAMITA SOLANKI

Head of Delivery Smart Spaces, Hitachi

- Hitachi is recognized as being ahead in developing and implementing new concepts, particularly in the realm of water systems. Hitachi's Intelligent Water System concept is an example of innovative technology that can address challenges in water management.
- Technology is seen as a solution to various challenges faced by the city, such as water leakage and waste management. Technology is to be used to enable efficient management and address these challenges effectively.
- There's a call for community-driven initiatives, suggesting that citizens should take responsibility for waste management by participating in source-level segregation. This highlights the importance of collective action in addressing societal issues.
- Collaboration with the government and understand their challenges to provide technological solutions. Hitachi is portrayed as a partner in social innovation, offering solutions to improve operational efficiency and reduce costs.

Panel Discussion - 2

LEVERAGING EXPERIENTIAL LEARNING OF GLOBAL BEST PRACTICES FOR URBAN TRANSFORMATION

NALINI MALIK

Chief Finance Officer,
Chandigarh Smart City Limited

- Government funds are allocated for projects and administrative expenses with guidelines allowing flexibility for different project models, including Triple P.
- Chandigarh's small size and sufficient government funding limit the scope for PPP projects, but there is potential for value-added projects like Integrated Command (IC) models.
- Focus should be shifted from solely on development to considering sustainability, especially in the context of smart city initiatives.
- Resource sharing and optimal data utilization among different departments must be done to avoid duplication of efforts and maximize return on investment (ROI).
- Utilization of artificial intelligence (AI) and technology, such as surveillance algorithms and traffic management systems can improve efficiency and resource utilization.

RAMESH GUPTA

Deputy Director General & SIO. NIC
Chandigarh

Panel Discussion - 2

- Chandigarh is offering over 25,300 services through a single platform, simplifying processes for residents of the city.
- Ladar data is being used for integratingindustry parks for mapping vacant plots, and collaborating with stakeholders for efficient management.Utilizing Ladar maps for urban planning, including setting up infrastructure like health centersand addressing boundary issues.
- Education sector isimplementing distance-based admission criteria and is utilizing GIS mapping for educational purposes.
- Property Tax Management is carried out by mapping property tax details and identifying discrepancies between property usage and tax payments.
- Electricity Connection Tracking is done by linking property data with electricity department records to identify mismatches in usage and property type.
- Mapping of cycle tracks is being carried out using Ladar data for engineering purposes, streamlining processes without physical measurements.

Panel Discussion - 2

DR. RAJESH PRASAD

Zonal Manager (GM), Punjab National Bank

- PNB is one of the biggest lender which started from the Chandigarh region. Also, PNB is the SLV state level Banker Committee convenor in the state of Punjab, UT Chandigarh and Haryana.
- Since 2016, PNB is associated with various PPP model projects on the lines of a stand-up and start-up projects envisioned by the Government of India.
- Collateral free loans are provided uptoRs. 10 crores under PPP model and loan of uptoRs. 5 crore is provided on individual basis for the start-ups.
- Earlier, 200 per cent collateral was required to take loans. It has been reduces to 30 per cent. On need basis, the same can go below 30 per cent as well.
- Earlier the concentration of loan sanctions was there at some places including the headquarters. Now, the country is divided into 22 zones headed by GMs and Chief General Managers. The GMS and CGMs have the power to sanction upto 100 crore of loan amount immediately within a TAT of 3 to 7 days if documentation process is completed.
- The then Managing Director SS Kohli was the first to implement Core Banking in the year 2002 while the counterparts of other banks were apprehensive about the results.
- Only private banks are supporting the entrepreneurs in the Green Field project in their start-up phase, they only come into picture when the business has been seeded for about 3 to 5 years and is now able to fruit.

Technology Presentation

RAJENDRAINANI

Business Head, Smart Cities, Tata Projects Limited

- Tata Projects Limited has implemented the Ludhiana Smart Street Lights project in partnership with Ludhiana Municipal Corporation.The project aims to promote sustainable growth and provide a safer, more livable environment by replacing traditional street lights with Smart LED lights.
- About 1,05,000 traditional street lights were replaced with Smart LED lights, controlled by a group control system via a SCADA system. The maintenance and complaint resolution are facilitated through a toll-free number and a mobile app, with over 1.30 lakh complaints registered and resolved.
- LED lights consume 60% less energy compared to traditional street lights, reducing carbon emissions by over 2.29 lakh tons in 7 years.
- The project incurred zero capital and operational expenditure for Ludhiana Municipal Corporation for 7.3 years.The projects are executed under a PPP model with zero capital cost to the Municipal Corporation.
- Tata Projects are ongoing in four cities—Pune, Ludhiana, Nashik, and NOIDA—serving over 3.72 lakh street lights.
- The lifetime energy savings of the project amount to Rs. 1,000 crore.- The project received the Energy Efficient Solution Award at the GFF Connect 8th Digital Transformation Awards.

ARUN M

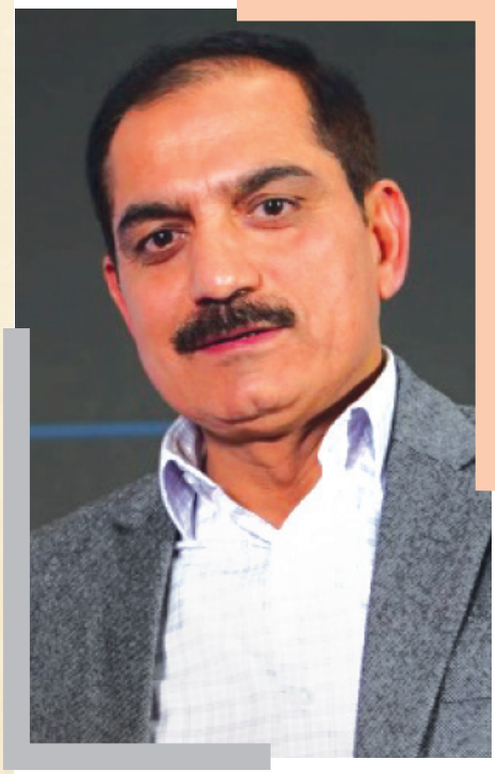
Deputy General Manager, Bharat Electronics Limited

- Farmers fail to understand the macros and micros requirement of the plant. Hence the yield is affected by the same
- Once the crop is ready for the market, there comes another set of issues. The farmers faces the problem of selling at the right place and right price.
- With the mobile application created by Bharat Electronics, farmers can get information regarding the soil quality, sunlight availability, micro nutrients in the soil etc. Further the farmer is supposed to enter the growth of his plant every week for new analysis to be done.
- The mobile application also comes with sensors for animal monitoring. One can predict the illness of the animal, the yield and the quality of the milk.
- The global temperature by 2040 is assumed to raise by 2 degree. Curretly, 300 and 320 PPM of carbon dioxide is noted all around the globe.
- If the PPM of carbon dioxide exceed 430, the yield of the crop will be substantially low.

Presentation

Panel Discussion

NAVIGATING TOMORROW'S CITIES: INNOVATIONS IN URBAN MANAGEMENT



N P SHARMA

Chief Engineer, Municipal Corporation Chandigarh

- Recognized a problem with garbage collection efficiency and implemented a smart solution involving GPS-fitted vehicles and GIS mapping of households.Hence, improved Garbage Collection resulted in a significant reduction in missed collection points, from 14,000 to about 700, within a year.
- Triple P Model for Urban Development highlighted the importance of Public-Private Partnerships (Triple P) in leveraging technology and resources for urban development.
- There are numerous examples of successful PPPs such as public bike-sharing system. The emphasis is laidon the importance of choosing the right partners.
- There must be capping on the number of vehicles per individual, lane width should be reduced to prioritize pedestrians, and parking spaces need to be created to address urban mobility challenges.
- Future Planning for Chandigarh highlighted as the need for strategic planning considering Chandigarh's limited vertical growth and estimated population growth until 2050-2060. This includes assessing resources like water supply and solid waste management, and managing parking needs effectively.

Panel Discussion

Panel Discussion

PRADHUMAN SINGH

Joint Secretary Transport cum Director Transport, Chandigarh Administration

- Plans for a metro system in Chandigarh are underway, with comprehensive planning and analysis being conducted and implementation of online traffic management tools has improved traffic flow in the city.
- Chandigarh faces the challenge of high vehicle density, with a per capita vehicle holding rate being the highest in India.
- Initiatives such as the Tri City bus app, enhanced security measures, and improved reliability aim to shift commuters from private vehicles to public transport.
- Development of a multimodal transportation app to provide citizens access to various modes of transport through one platform has eased out access to public transport in the Smart city.
- Implementation of electric buses has led to significant reductions in diesel consumption and carbon dioxide emissions.Electric vehicles offer cost and maintenance benefits, including lower maintenance costs and longer battery life compared to diesel vehicles.

Presentation

SUDHIR SINGH CHAUHAN

Chief Town Planner, Faridabad
Metropolitan Development Authority

- Adoption of mixed land use concept along the National Highway to shorten trips and promote the use of cycles and smaller vehicles for urban mobility.
- Himachal Pradesh government's adoption of an e-vehicle policy in response to ecological sensitivity aims to promote environmentally friendly practices.
- Integration of urban planning with modern transportation systems, including the development of roads, city bus services, and urban horticulture initiatives enhance urban mobility.
- Similar challenges to nearby Delhi, including traffic congestion, limited public transport, mixed land use, and last-mile connectivity issues, stemming from its industrial legacy.
- Recognition of the need for community spaces in urban areas to facilitate social interaction and provide affordable gathering places for nuclear families.

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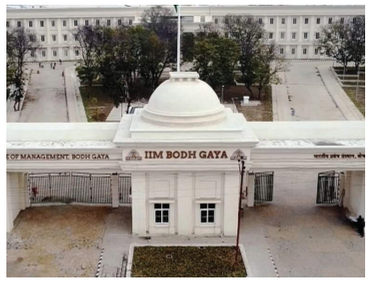
PGCIL Faridabad

IIM Jammu

IIT JAMMU

Lucknow Railway Station Charbagh

IIM Bodh Gaya



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A Collaborative Effort for a Greener Future: Unlocking Rail's Potential

The recent Unlocking Rail's Potential: Efficiency & Sustainability KnowledgExpo successfully concluded on May 9th at the Shangri-La, New Delhi. This dynamic workshop united industry leaders, experts, and passionate minds with a common goal: transforming India's railway sector for a sustainable and more efficient future.

The collaborative platform was enriched with insightful presentations, interactive sessions, and networking opportunities. A highlight was the thought-provoking panel discussion, "Navigating the Future of Railway Transportation." Here, M S Azam (Project Engineer, Delhi Integrated Multi-Modal Transit System Limited), Nikhil Vijay Bagalkotkar

(Director-Tech Sales APAC (AEC) at Autodesk), and Vatsal Trivedi (BIM Team, Egis India Consulting Engineers Pvt. Ltd.) brainstormed innovative solutions and strategies to ensure sustainable growth within India's vast railway network. These discussions laid the groundwork for a more sustainable future of rail travel in India.

Autodesk's initiatives and advancements fuel this technological leap forward, propelling the sector towards a greener tomorrow. Recognising the Indian railway sector's significant growth projection of doubling passenger and freight activity by 2050, Autodesk offers a comprehensive suite of solutions designed to empower efficiency, productivity, and sustainability.

Their commitment is evident in the Autodesk State of Design & Make Special Edition – Spotlight on Rail survey. The survey highlights the substantial benefits of digital transformation for railways, including:

- **Enhanced Data Exchange:** Improved communication and data sharing across project teams.
- **Informed Decision-Making:** More effective planning and design processes.

Autodesk's commitment to innovation extends to specialised solutions and a proven track record of success stories showcasing improved efficiency, reduced project timelines, and enhanced safety measures in major rail projects.

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- **Increased Productivity and Profitability:** Rail leaders have reported significant improvements.

Autodesk provides comprehensive solutions that support every phase of a railway project, from the initial planning stages to execution:

- **From Vision to Reality:** Tools like Autodesk Civil 3D, tailored with Indian standards, templates, and reports, enable precise planning and conceptual design.
- **Detailed Design and Beyond:** Autodesk InfraWorks facilitates detailed design and drawing production for complex railway infrastructure projects.
- **Collaboration is Key:** Autodesk's solutions bridge communication gaps, ensuring seamless coordination across various project stages and aligning all stakeholders.

Autodesk's commitment to innovation extends to specialised solutions and a proven track record of success stories showcasing improved efficiency, reduced project timelines, and enhanced safety measures in major rail projects.

The Unlocking Rail's Potential KnowledgExpo highlighted this collaborative spirit. With attendees and speakers actively participating in shaping the industry's future and Autodesk providing the technological muscle, the Indian railway sector is well on its way to a sustainable and efficient future.

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