

2025: Usher a new Vision with GIS

Make our cities more livable



As per the Global Livability Index of 2024, five Indian cities figured on the list comprising 173 across the world. Indian megacities Delhi and Mumbai tied for 141st place with a score of 60.2 out of 100. They were followed by Chennai (59.9), Ahmedabad (58.9), and Bengaluru (58.7). Factors like traffic congestion, pollution, and infrastructure issues have made our cities 'barely livable'.

The Smart Cities Mission, with a goal of 100 smart cities was conceived to address these issues but was only partially successful. The Smart Cities Mission had two main aspects:

area-based development consisting of three components – redevelopment (city renewal), retrofitting (city improvement), and green field projects (city extension); and pan-city solutions base lakh crore was kept aside for the mission, with public-private partnerships (PPP) an important driver of the same. A total of 6454 projects worth Rs 86,063 crore were sanctioned, but a viable PPP model could not be evolved.

Though no clear definition of a Smart City was articulated, the expectation was to improve the living conditions for inhabitants in our cities. Most cities selected very small areas

for improvements like street lighting, wi-fi, and solid waste management. The area being small, the impact wasn't felt, and probably '100' was a very ambitious number. Learnings from this program can guide future initiatives for making our cities more livable.

Data-driven decisions play a crucial role in the success of such mission-mode programs. GIS brings different types of data, whether from satellites or aerial surveys or data from ground surveys, or data from IOT devices, together on a single platform, provides actionable insights, and enables scenario-based analysis. GIS assists in activities like:

- Master Planning
- Land Use Management
- Sustainability and ecological protection
- 3D Visualization of proposed habitat
- Infrastructure planning, including mobility
- Esthetics and functionality of proposed infrastructure
- Construction monitoring
- Infrastructure management

GIS enables 'Geodesign' to achieve optimum design based on geographic attributes and functional requirements of the urban area. Geodesign provides a methodology to efficiently evaluate alternative design scenarios, providing the ability to interactively create, alter, visualize, and make trade-offs to arrive at the most optimal designs.

Let us consider a scenario where city management decides to build a new suburb to cater to the growth of the city and identify an area of 500 Sq Kms. for development for 500 people per square kilometer.

A survey of the land will give a good idea of its topographical attributes - contours, water bodies, trees or forests, pre-existing infrastructure, etc. This data is brought into a GIS system.

Considering the geographic features of the land, planning for housing, industry, or other workspaces, facilities like schools, hospitals, and open spaces like parks, shopping, recreation, etc. are done and brought to the same GIS system. Next comes the planning for buildings, utilities, drainage, roads, parking facilities, etc. Geodesign comes in, assumptions

are made, and 3D building models are created in the GIS. If a residential area is designed with 8 buildings, each with 18 floors and 8 apartments per floor, GIS assists in the planning of open space, parking, utilities and drainage requirements, and road designs for optimum movement of traffic, following regulations and building by-laws. In this digital canvas, different scenarios like understanding the impact if the height of all buildings is increased to 25 floors instead of 18, are easily simulated. Simulations based on population growth over a long period of time, changes in weather patterns, etc., can also be carried out. Multi-modal transport systems can be planned. Factors like carbon neutrality can be studied and factored into the planning of the new urban area.

Geodesign also facilitates designing urban areas with better aesthetics, views from different points, shadows on buildings, and the solar potential of the city. The same concepts are applicable if it is about the redevelopment of an existing township.

GIS-based urban planning can immensely contribute to the vision of Viksit Bharat. GIFT City near Gandhinagar is a shining example of the use of GIS in the planning, execution, and management of an urban body. GIFT City is a good example of a Smart City.

To conclude, our recommendations are - pick a smaller number of cities, maybe 3, for transformation into smart cities. Make the transformation impactful by incorporating - aesthetically and functionally better design, uninterrupted water and electricity, an efficient drainage system to avoid flooding, a multi-modal transport system, planning of roads and parking with future growth in mind, and modern architecture to support the need for sustainable and resilient infrastructure.

Let the new year 2025 be the beginning of making our cities more livable, smart cities are one of the ways; others could be interventions like Swachh Bharat Mission 2.0 to address the waste management in cities and building new toilet facilities, efforts on pollution control, addressing the issue of urban flooding, improvement in transport systems, 24x7 water, safety and security and improvements in aesthetics.