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Smart City Solutions

GIFTCL deploys latest technologies for efficient service delivery

The Gujarat International Finance Tec-City (GIFT), which is one of the few smart cities under development in India, became partially operational in January 2013. So far, one tower has been inaugurated. Once fully operational, GIFT will comprise not only commercial buildings but also residential buildings, and other physical and social infrastructure. A key aspect of the project is the use of technology to integrate various aspects and functions to establish a smart city.

Project positioning and structure

GIFT aims to harness India's financial services potential by offering world-class infrastructure. The growing demand for financial services, the increasing cost of business operations in metros and unplanned development of financial centres across India were the key drivers for the Gujarat government's decision to develop the hub. GIFT will target 6-8 per cent of the financial services potential in India and create 1 million direct and indirect jobs.

The central business district covers an area of only about 3.5 square km. Therefore, the government has earmarked the surrounding areas as GIFT expansion zones. Development in these zones will take place in line with that of GIFT to facilitate seamless and integrated development in the region. GIFT will be divided into two parts – a multi-service special economic zone (SEZ) and the domestic tariff area. Almost 260 acres will be allocated to the SEZ, one of the first multi-service SEZs in the country, which has also been notified as an international finance services centre by the Ministry of Commerce.

The built-up area will be 62 million square feet. An additional 30 million square feet will be developed after the removal of the height restriction by the Airports Authority of India. Of the total area, 67 per cent will be used for commercial buildings, 22 per cent for residential

buildings and 11 per cent for social infrastructure. Of the total built-up area of 92 million square feet, 10 million square feet will be developed in Phase I, 22 million square feet in Phase II and 30 million square feet in Phase III.

The state government, through state-owned Gujarat Urban Development Company Limited (GUDCL) and Infrastructure Leasing & Financial Services (IL&FS), has established a 50:50 joint venture (JV) company, GIFT Company Limited (GIFTCL). At a conference on Smart Cities in India organised by *Indian Infrastructure*, Prakash Gaur, vice-president, GIFTCL, described the planning. He said, "At the outset we undertook three tasks. We did not begin with master planning, but first engaged McKinsey & Company to provide us a top-down approach for the project. Second, we appointed British Telecom to provide the communications strategies. Therefore, our information and communications technology (ICT) master plan was in place right at the beginning. Also, we appointed Hewitt

Associates to prepare a talent master plan. At the same time, a JV – GIFTCL – was formed by GUDCL, the nodal agency for developing Gujarat's urban infrastructure, and IL&FS, a company involved in commercialisation of infrastructure to implement the project."

GIFT is planned to be developed in phases. Each phase is divided into multiple real estate packages. GIFTCL would develop infrastructure either on its own or through separate special purpose vehicles (SPVs) in partnership with private players. Each SPV would be self-sufficient and stand-alone. GIFTCL will consider buying a stake in some of the SPVs. These SPVs include GIFT SEZ Limited, GIFT District Cooling Systems Limited, GIFT Water Infrastructure Limited, GIFT Waste Management Services Limited, GIFT Power Company Limited and GIFT ICT Services Limited. GIFTCL will lease development rights for real estate projects, which will be undertaken by various real estate developers and end-users.

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Interview with R.K. Jha, Director, Gujarat International Finance Tec-City Company Limited

Could you briefly tell us about the objective of GIFT?

GIFT envisages becoming a hub for financial services and other multi-services sector. The city will offer a unique opportunity to undertake international and domestic operations in financial services in close proximity.

GIFT will complement other financial districts in Asia. It will provide an environment similar to the one global companies experience in other developed countries. This environment will be provided in Asia's second largest growing economy at a very competitive price. As various institutions are looking at India for development, setting up base in GIFT will become a natural choice as it will provide state-of-the-art physical and ICT infrastructure.

The project is expected to set standards for a sustainable business environment and lay down a new format for globally benchmarked integrated cities.

What kind of infrastructure development is under way at GIFT?

World-class infrastructure development is currently under way. The road network is being developed in a manner that will make the city a zero-accident zone. GIFT will also ensure 99.999 per cent power reliability, which means outage of 5.3 minutes per annum. An automated waste collection system to maximise recovery, and minimise emissions, environmental impact, human intervention, space requirement and impact on health will be deployed. Several sewage treatment plants are also being built. In addition, surface runoff and rainwater is planned to be stored. For water infrastructure, construction of a raw water pumping station, transmission main water supply from the Narmada canal to GIFT and water treatment plants is under way.

An artificial waterbody of 1.2 km, which will have a storage capacity for 15 days' use by the city and for recreational and entertainment purposes, is also planned. A district cooling system for commercial use is being installed for the first time in India, with the aim of reducing use of energy, maintenance cost, and noise and vibrations, and improving air quality. Five multilevel car parks, with a capacity of 10,000 cars each, have been planned.

What kind of benefits will the government receive from this city?

GIFT is expected to annually contribute tax revenues amounting to Rs 46 billion to the state government and Rs 70 billion to the centre by 2020. The city will also contribute between $25 billion–$55 billion to the GDP, of which around $10 billion will be contributed through investments in the real estate space, interiors and infrastructure by 2020. In addition, GIFT will generate employment opportunities for about 1 million people directly and indirectly.

How has the concept of sustainable development been emphasised?

High-rise buildings will be developed to optimally utilise the land pool reserved for GIFT. This development will be supported by world-class infrastructure provision and green cover. With land becoming increasingly scarce, it is important to preserve it and maximise its use. This can be done only if the city is well planned and infrastructure is developed from the start itself. In a horizontal-spread, the cost of infrastructure increases because one has to lay long lengths of sewage lines, water pipes, roads, etc. Transportation costs also increase in a sprawled development.

With regard to environmental concerns, GIFTCL has already acquired the necessary environmental clearances required. Moreover, GIFT is being developed on wasteland. Almost 60 per cent of GIFT's area is going to be green cover. The city is designed as a zero-discharge city. Automated solid waste collection will minimise human intervention and thereby raise hygiene standards in the city. All buildings in GIFT are designed to be energy efficient buildings and would contend to get Leadership in Energy and Environmental Design ratings.

GIFT has been designed on the walk-to-work concept. A public-private transport modal split of 80:20 will be achieved by providing BRT and metro rail systems, thus reducing traffic and reducing the carbon footprint. In addition, the master plan of the city emphasises the demand management of water, with adequate supply to ensure quality of life. ▶

Integrated smart development

GIFTCL is deploying an integrated smart development model to develop the city. Centred on using the best practices in urban governance, the company will ensure uninterrupted and reliable power supply; development of next-generation water supply, waste management and district cooling systems; construction of metro rail and bus rapid transit (BRT) systems and roads to ensure a public-private modal split of 80:20; setting up of high quality entertainment malls with almost 60 per cent of green space; construction of housing with an emphasis on the walk-to-work concept; establishment of educational institutions, international schools and privatised hospitals; development of a high-rise commercial district with landmark buildings; etc. The communications network will involve broadband fibre-to-the-premises, Wi-Fi, shared IT services, etc.

One of the key challenges in setting up a smart city is that there are several stakeholders, but they need to be brought on to a common platform. "There are several intelligent cities in the world where technology is deployed separately for power, water supply, transport, etc. It is easy to deploy technologies in silos, but these need to be integrated for smart city development. All components of a smart city have to communicate with each other and should be compatible," says Gaur.

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The city-level system architecture will involve the setting up of the GIFT City Control and Command Centre, which will manage the city's transport systems, gas supply, power supply, water supply, waste management, district cooling systems, security and surveillance, emergency, fire safety, landscaping systems, irrigation systems, city advertisement and city information management. The city command centre would take critical live feeds from all control centres and enable these centres to take remedial action in case of an emergency. The use of technology will result in smart transport, smart buildings, smart streets, smart landscape, smart urban infrastructure, smart parks, smart desks, smart streets, etc.

In terms of architecture, each building will have its own control centres. For the first two buildings, the centres are already in place. Also, there will be the GIFT city utility corridor, the GIFT ICT system, the GIFT power supply system, the GIFT district cooling system, the GIFT water supply system, the GIFT sewerage system and the GIFT solid waste system. These systems will have their own development modules. All these modules and the building modules have to come on the city level IP backbone. All these systems need to communicate with the GIFT City Control and Command Centre. The interface between them will be crucial.

Emphasising infrastructure development, Gaur said, "As far as infrastructure is concerned, we have already made provisions for three metro lines and four stations. We want to discourage the use of bottled water and we are committed to providing drinkable water from any tap in the city. In addition, we want GIFT to be a zero-discharge city. In the case of power, adding each 0.09 per cent reliability involves large investments. Therefore, one has to understand the economics. And for the remaining 0.001 per cent, a backup option has to be provided. In waste systems, a unique city-level evacuation system will be set up, which will be very well monitored and controlled, and will have an automated segregation system. And once critical mass is reached, the waste will be used by an insulation plant to convert it to energy. A district cooling system, based on the principles of economics for reaping economies of scale, is being installed, which will be monitored and synchronised. ICT will be the backbone of the city. The broad ICT layer will include infrastructure, services, platform and applications."

- **Smart transport:** This will include the use of interactive road maps, automatic vehicle location and tracking systems, road condition systems, transit node management, real-time travel response, parking management, etc. This will facilitate ridership analysis, accident reporting, emission monitoring, safety management and asset management.
- **Smart water:** This will include ensuring a position where potable quality water is available in all taps in the city and water is available on demand. In addition, the focus will be on making GIFT a zero-discharge city. It will involve monitoring of utilities, metering, leak detection and deployment of controllers.
- **Smart power:** This involves underground cabling for power distribution in GIFT, substation and distribution automation, and deployment of indoor substation (gas-insulated switchgear substation for subtransmission and distribution within GIFT, and compact substations in buildings). A power control centre for power supply monitoring, power loss detection, grievance redressal, power consumption and efficiency monitoring, and emergency power supply monitoring will be set up.
- **Smart solid waste management:** The objective is to maximise resource recovery; minimise emissions and the environmental impact, human intervention, space requirement and impact on health; reach a stage of zero waste visibility; and achieve a power-neutral state. An automated waste collection, transportation and segregation system will be deployed. There will be a focus on monitoring e-waste, biomedical waste, hazardous waste handling, central waste handling, residual waste handling, etc.
- **Smart district cooling system:** This system will enable efficiencies through economies of scale, reduce energy and maintenance costs, improve the air quality and temperature control, and reduce noise pollution. The district cooling system control centre will undertake monitoring of the district cooling plant system, simulation of cooling energy requirements, interface analysis, evaluation of extensive economic scenarios, etc.
- **ICT:** GIFT's ICT vision is to develop infrastructure, services and platforms, and offer financial service enterprises a competitive advantage to operate regionally and globally.
- **Intelligent building management system (IBMS):** This includes a building management system, a fire detection and alarm system, a public address system, a security surveillance system and an access control system. Intelligent buildings will have modular structures and will be freely expandable at any stage; they will have the flexibility to cater to new evolving in-building services; track and address tenant needs and be vendor independent; and allow interfacing and integration with all utilities' services, etc. The IBMS architecture will include green buildings, a security and surveillance system, and a lift safety system. Therefore, all these components, which are being managed by the building control centre, are covered and these are connected to the command centre. The city-level command centre should be able to manage any untoward incident in the building. These buildings will be developed by a third party and not GIFTCL. Specific guidelines need to be followed to integrate each component into a common thread.
- **GIFT urban information system:** This will involve urban and regional planning, master planning and design, infrastructure planning and civic services, a decision support system, overall impact assessment, and thus improving quality of life by creating a better environment.
- **Real-time GIS applications:** Applications such as analytical modelling and simulation, design optimisation, resource consumption, conflict determination and resolution, project progress monitoring, status/compliance monitoring, infrastructure management, city security/surveillance, environmental monitoring and emergency response will be deployed. ◆
Namrta Bangia

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Key Statistics

Current status of projects and reforms under UIG and UIDSSMT sub-missions

State	UIG		UIDSSMT		% of completed projects under UIG and UIDSSMT	Reforms (UIG)		
	Projects sanctioned (No.)	Projects completed (No.)	Projects sanctioned (No.)	Projects completed (No.)		Reforms status on March 31, 2009	Reforms status as on December 31, 2012	Improvement in reforms achievement (2008-12)
Andaman & Nicobar	–	–	1	–	–	–	–	–
Andhra Pradesh	52	20	84	57	57	51	86	35
Arunachal Pradesh	3	–	9	9	75	4	50	46
Assam	2	–	30	9	28	25	70	44
Bihar	8	–	11	–	–	12	36	24
Chandigarh	3	–	–	–	–	26	54	28
Chhatisgarh	1	–	4	–	–	16	85	69
Dadra & Nagar	–	–	1	–	–	–	–	–
Daman & Diu	–	–	1	–	–	–	–	–
Delhi	23	8	–	–	35	25	73	48
Goa	2	–	3	–	–	14	33	18
Gujarat	71	42	52	25	54	51	90	38
Haryana	4	–	9	3	23	15	54	39
Himachal Pradesh	5	–	8	4	31	23	74	51
Jammu & Kashmir	5	–	47	7	13	4	48	43
Jharkhand	5	–	6	–	–	4	59	55
Karnataka	47	23	38	11	40	40	82	41
Kerala	11	–	25	1	3	29	70	41
Madhya Pradesh	23	9	68	13	24	29	83	54
Maharashtra	80	27	95	18	26	43	83	40
Meghalaya	2	–	2	–	–	4	67	63
Manipur	3	–	5	–	–	9	46	37
Mizoram	4	–	2	–	–	9	59	50
Nagaland	3	1	2	–	20	13	39	26
Orissa	5	1	18	3	17	17	74	57
Puducherry	2	–	1	–	–	9	41	32
Punjab	6	1	17	1	9	15	55	40
Rajasthan	13	4	37	11	30	25	70	45
Sikkim	2	–	5	–	–	9	59	50
Tamil Nadu	48	15	122	100	68	60	86	25
Tripura	2	–	4	2	33	15	74	59
Uttar Pradesh	33	4	64	29	34	15	87	72
Uttarakhand	14	–	1	–	–	10	55	45
West Bengal	69	17	35	9	25	45	75	30
Total	**551**	**172**	**807**	**312**	**36**			

UIG: Urban Infrastructure and Governance; UIDSSMT: Urban Infrastructure Development Scheme for Small & Medium Towns
Source: Ministry of Urban Development