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Steering future Indian cities

Lavasa, a hill city currently under development near Pune in India, is integrating GIS in all stages of planning to offer enhanced quality of life to its residents

India's success on the economic front has not only made it one of the hotspots on the global economic landscape but also brought about social changes in the country. It has fuelled aspiration among people about quality of life and quality of space they use including private and public spaces. Architect and urbanist Charles Correa once said "I would like to live in a city which is a great city and a great place. Modern Indian cities are great cities but terrible places." Most of the cities in India lack the availability of safe, approachable, livable and associative public spaces.

Lavasa, a hill city currently under development near Pune, is setting up the benchmark for future

Indian cities. The core idea of Lavasa master plan is to create a hill city to Live - Learn - Work - Play. Lavasa is pioneering in providing excellent quality of life to its residents. A well designed public realm is the hallmark of Lavasa. GIS has enabled Lavasa to sensitively incorporate the natural features in the master plan, paving the way to a sustainable and livable town. Planners in Lavasa have realised that the potential of GIS is limited not only to master planning and overall development strategy but it is also essential for the next level of detailing of public realm. Thus urban design benefits significantly from GIS which allows design innovation to not only achieve the desired effect regarding public realm but also analyse

scientifically pre- and post-design situations.

Relationship between GIS and urban design

Understanding patterns, be it of activities in public realm, land use, facade styles, value of property or just movement patterns, is one of the key factors which helps urban designers evolve design strategies for a given place. All these patterns must be understood spatially since the solution is governed by spatial designs. GIS comes handy to urban designers in studying patterns. GIS can map various such patterns on the same spatial reference and can overlay these patterns to draw critical inferences which become a guide for urban designers to take informed decisions.

The four elements of geodesign: sketching, spatially-informed models, fast feedback and iteration make GIS very useful to spatial designers working at multiple scales. In Lavasa, urban designers have used the analytical capabilities



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Figure 1

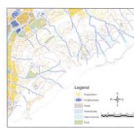


Figure 2

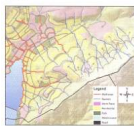


Figure 3

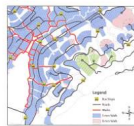


Figure 4

of GIS extensively to solve urban design tasks. GIS provides critical mapping and overlay analysis to master planners from the very inception stage of master plan. Subsequently, various layers resulting from the master plan are provided to urban designers in required format to understand the patterns better.

GIS helps designers map the design decision to understand the pattern anticipated to evolve as a result of those decisions. GIS also helps designers get feedback from various stakeholders on the design decision by posting it on the intranet GIS portal.

Quick 3D visualisation of built form

The primary output of any urban design exercise is the well visualised character of buildings of the

town. The most effective tool to create homogeneous built form is to prescribe the common architectural elements across the buildings in the town. Depending on the geographic expanse, one town may have the same architectural character or a variety of different districts. Thus, the prescription for architectural elements may also remain the same or may differ. The designer, in order to understand the relevance and appropriateness of the built form, must get a quick 3-dimensional visualisation of the suggested design. In order to zero in on the best built form, several iterations may be required.

Pedestrian walkways

The basic concept of Lavasa master plan is based on the principles of new urbanism. It configures the

land use distribution in such a way that concepts like "Walk to Work," "Walk to School" and "Walk to Park" become a reality. The town centre is the hub of all work places, education, leisure and socio-cultural activities. Care has been taken that maximum permanent residents stay within walking distance of their workplaces. In July 2009, Lavasa management took a decision to strengthen "Walk to Work" by building pedestrian walkways in Dase town in Lavasa.

With the help of GIS, the pattern of population density and work place resultant of land use was mapped (Figure 2). It was overlaid on the slope map, natural ravine pattern and proposed parks. Due to the hilly terrain, the streets were on different altitudes. The overlay analysis showed the need to connect these streets. The projected population density mapping also determined the number of people who are anticipated to use the pedestrian walks and thus the frequency and width of such connections was determined. The walkways were categorised into formal and informal walks keeping in mind the slopes, amount of people and frequency of usage (Figure 2). Finally the well executed, safe and robust walkways were constructed and will provide quick and safe access between workplaces and homes in Dase (Figure 3).

Internal bus transport nodes

Taking the next step of creating a safe and livable city, it is imperative for Lavasa to have an efficient, reliable and viable public transport system. Lavasa initiated a study for internal bus routing system. This

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study was in continuation with the overall traffic modeling study for the entire Lavasa. The bus system was created to cater to the permanent resident population as well as the tourist population. The traffic study used GIS extensively by utilising the capabilities like shortest path and scenario generation.

The designed bus system used all the analysis done for traffic study and was overlaid on the population density pattern. The results helped to determine key factors of a viable bus system: the bus routes, frequency of trips and density of bus stops. The location of bus stop was based on the factor that maximum amount of population has to be within reach of 5 minutes walk from bus stop. GIS was used for analyzing the proposed bus stops for their proximity to houses and work places. In general a distance of 360m to 450m was considered to be within 5 minutes walking distance. Post design GIS analysis showed that with the help of pedestrian walkways and road sidewalks, 85 to 90% of population was within 5 minutes walk and 90 to 100% of the population within 8-10 minutes' walk (Figure 4).

Collaborative process of design

The most significant aspect of urban design, which sets it apart from all other design processes, is that the design product is not and cannot be conceived by a single stakeholder or a single discipline. In Lavasa, it is a collaborative process involving town planners, urban designers, architects, landscape architects, product designers, branding teams, engineers, execution and operation experts, security experts and most importantly the user. It is the consensus and creative inputs of all these stakeholders which makes the design and resultant created space a success. Lavasa GIS provides the essential platform to disseminate the concept and collaboration of all the inputs at a rapid pace. The future of geodesign and other GIS-based design technologies will bring far more flexibility and speed in design decision and make our cities a much better place. 

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