

[ArcNews Online](#)Search ArcNews  **Summer 2006**[Table of Contents](#)[About ArcNews](#)[Article Submission Guidelines](#)[Advertising](#)[Subscribe](#) E-mail**In India, a 10,000-Acre Planned Community Is Becoming a Reality  
Kick-Starting Enterprise GIS**

Lavasa Corporation Limited was formed to undertake a large-scale lifestyle development in India. Based on new urbanism principles, and located near Pune, India, a township is being developed over a sprawling area of approximately 10,000 rolling acres. Lavasa is located on the backwaters of Warasgaon dam on the Western Ghats between Pune and Mumbai. The township is master planned with the objective of striking a balance between cosmopolitan architecture and environmentally friendly surroundings. With proximity of 90 minutes to Pune and 4 hours to Mumbai, Lavasa presents an attractive holiday location for urbanites. Tropical Lavasa has three main seasons: summer (March to May), monsoon (June to September), and winter (October to February).



**A macromedia Flash-based GIS viewer for customers and departments that need only basic viewing ability.**

The master plan for the Lavasa Project calls for a modern "hill town" in harmony with nature. This master plan won both the Award for Excellence 2005, given by the Congress for New Urbanism (USA) and the American Society of Landscape Architects Award—2005. The concept of a hill town (or hill station) dates from British colonial times and describes locations where British administrators fled to escape the worst tropical humidity and heat.

Lavasa will consist of diverse neighborhoods, focusing on upper middle class to affluent families. It will include business parks made up of employers, such as commercial, institutional, and information technology (IT) firms, as well as nonpolluting processing firms. Modes of commuting will vary from personal cars to ferry transport to ropeway (i.e., skyway or ski lift-type) traffic and, possibly, electric public buses.

Many corporate names are involved in the Lavasa Project, each with a stake in the synergies provided by the enterprise GIS. The architectural master plan is the work of HOK, USA. Accenture and ACNielsen conducted the project feasibility and research. Landor (Hong Kong) is handling branding and identity. Hindustan Construction Company—one of the largest private sector construction companies in India—is undertaking all construction activities. Hicon Techno Consultants is the primary engineering consultant.

**Enterprise GIS and Lavasa's IT Vision**

The developers of the Lavasa Project mandated high urban planning design standards with a robust IT that is able to make the city of Lavasa uniquely digitally enabled. The city has invested in ESRI-based GIS technologies—ArcGIS Desktop (ArcView, ArcEditor,

and ArcInfo), ArcIMS, ArcSDE, ArcReader, ArcGIS Publisher, and more. In addition, it is using customer relationship management (CRM) systems, document management systems, and enterprise resource planning. GIS is being used at the earliest possible stages of design, planning, and construction. These investments in IT have the goal of providing a highly efficient city administration and e-governance for citizens. Lavasa's GIS will eventually be a central hub, providing information to municipal governance departments, citizens, prospects, service providers, and developers.

The geodatabase is on Microsoft SQL and is accessible via ArcSDE to Internet/intranet/LAN users. Web users can access ArcSDE data through a customized ArcIMS viewer. Editors access ArcSDE data either directly via ArcEditor or CAD clients. Off-site users can view the database through ArcReader.

### Implementing GIS at Lavasa

RMSI Private Limited, Business Partner of NIIT-GIS Ltd., ESRI's distributor in India, commenced work on Lavasa on December 6, 2004. RMSI's extensive experience in executing large GIS projects was a factor in its selection. The first step was a detailed user needs assessment during which requirements were documented. During this first phase of the project, RMSI—in consultation with project personnel—prepared a detailed road map report for project management, presenting systems and functionalities for each department.



An artist's impression of Dasve, the first town within Lavasa.

For status monitoring, the GIS allows users to link and view pictures, documents, etc., thereby allowing a more visual status description.

**3D Visualization and Survey Data**—Lavasa is located on undulating terrain. This requires that the enterprise GIS be 3D enabled. To provide good access to 3D data, users are being provided 3D model visualization data—created with the ArcGIS 3D Analyst extension (which includes the ArcGlobe application)—that is published using the ArcGIS Publisher extension on their desktops. In addition, this data gives a three-dimensional insight to key stakeholders when discussing matters related to terrain. From a marketing perspective, the terrain plays a vital role for customers weighing which plot to purchase. Since not all customers can necessarily come to the construction site, the 3D GIS offers an inexpensive but effective selling option.

Lavasa Project's Planning Department is using slope maps, aspect maps, and digital elevation models for business uses, ranging from estimating sellable area in a plot to landfill site identification and security post location selection. The design team has used 3D visualization to analyze possible options of creating tunnel access along hills to shorten commute time to the city. Using the finished road levels, the GIS team did cut-fill analysis of road stretches. Such analysis results have increased confidence and faith in GIS among traditional CAD users. Three-dimensional GIS was also used to identify suitable locations for cellular phone towers.

**GIS Database Model**—The GIS database model has been developed to capture multiple aspects of the city, from utilities to environment, tourism, and land title information. The data model development over the last year has aimed at capturing as much variety in spatial features as possible. In the current phase, the focus is on increasing quality and coverage of attribute information. The ArcFM data model from ESRI Business Partner Miner and Miner, a Telvent company (Fort Collins, Colorado), for water and sewer was also studied in detail to assess what further attributes need to be part of the existing GIS model so that a later data migration exercise to ArcFM can happen with relative ease.

**Symbology and View Standardization**—From the outset, the GIS team realized that engineering data needed to be presented in a visually appealing manner. Then all interfaces to data needed to present the same visualization of the data. This prompted the team to select ArcGIS Desktop as the de facto data visualization interface. For

Internet services, the mapping service used an application as the front end that was built using ArcIMS and Macromedia Flash. For LAN usage, especially for presentations, ArcGIS Desktop was directly used to access a personal geodatabase that was synchronized with the central ArcSDE database. For off-site field users, data was published from the same database using the ArcGIS Publisher extension.

**Address and Asset Standardization**—A new city development provides a unique opportunity to have the address database created for ideal GIS addressing standards. The building addressing standard implemented at Lavasa was developed by studying U.S. addressing standards, then customized according to Indian realities. A good addressing standard facilitates usage of industry-standard geocoding engines that, in turn, will help in the development of proper disaster management, utilities operation, and maintenance systems.

**Environment, CRM, and Sales Monitoring Systems**—The Lavasa Project has been designed in harmony with the area's rich natural beauty. One of the objectives of the GIS portion of the project is to integrate environment pollution monitoring with the enterprise GIS. Lavasa also has a CRM solution for sales management as part of its IT plan. Since "land" is the "product" of this CRM, GIS fits in as the natural technology to use in site location. Presently, the GIS team actively helps Sales Department staff monitor plot sales and decide on and mark out premium plots and enables them to help customers select their plots.

**Metadata Management**—With more than 125 feature classes in the ArcSDE database, rapidly changing data, and multiple sources of input data, metadata management and update are key activities. The GIS team is using the ArcGIS metadata update system to keep the metadata up to date. A periodic backup of metadata is performed to ensure that these critical details are preserved.

### The Road Ahead

Incorporating state-of-the-art technology, such as enterprise GIS, into a large project is inevitably challenging. As proven again at Lavasa, ironically the largest challenges are rarely technical in nature. Instead, primary challenges tend to involve gaining support/acceptance from users coming from different domains. However, once users are able to see direct advantages filtering in by virtue of their work getting easier, more efficient, and more synergistic, these users will start embracing spatial technologies.

The various stakeholders of Lavasa can now clearly visualize what an enterprise GIS is capable of delivering. While there is still work to be done on the road to a fully articulated enterprise GIS implementation, the building blocks being placed "brick by brick" today will ensure that the vision of the GIS team will be met tomorrow.

### More Information

For more information, contact Dr. G. S. Rao, head (GIS), Lavasa (e-mail: [gsrao@lavasa.com](mailto:gsrao@lavasa.com)); or Ajita Kini, consultant, Lavasa (e-mail: [Ajita.kini@hccindia.co.in](mailto:Ajita.kini@hccindia.co.in)); or Rajesh Kalra, managing director, RMSI (e-mail: [rajesh.kalra@rmsi.com](mailto:rajesh.kalra@rmsi.com)); or Saumyajit Roy, project manager, RMSI (e-mail: [saumyajit.roy@rmsi.com](mailto:saumyajit.roy@rmsi.com)). ESRI India was actively involved in this project, providing technical training and consistent support to the Lavasa GIS team. Its technical staff's timely responses prevented unnecessary delays in implementation. For more information, contact Rajesh C. Mathur, managing director, ESRI India (e-mail: [rajesh.mathur@niit-tech.com](mailto:rajesh.mathur@niit-tech.com)).

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