

Honourable Chairperson Prof. V. S. Ramamurthy, Secretary – Department of Science and Technology, Dr. Prithvish Nag – Surveyor General of India, Dr. Michael Goodchild – Professor of Geography at the University of California, Dr. M. P. Narayanan, President CSDMS, Ms. Preetha Pulusani, President – IMGS Intergraph, Ladies and Gentlemen.

It gives me a great pleasure to be with this august gathering today. I would like to thank CSDMS for inviting me to deliver this keynote on – “G-Readiness of India: An Indian Industry Perspective”.

Over the past 30 years, the state of our ‘G-Readiness’ has increased greatly, primarily due to evolution of Remote Sensing and GIS technologies, which have moved from simple drawing applications to mature information systems. Today, these technologies have found wide acceptability across a range of application areas including land-use management, traffic routing / assignment, political redistricting, resource management, environmental modelling, Military Operations and many more. Their usage has become widespread, from the domain of scientific research, national level mapping and so forth, to being used by a large segment of users. This transition has happened because of the availability of GIS applications on the popular Windows platform, the increasing penetration of Internet and initiatives like the Open GIS Consortium, which are all taking us towards becoming more ‘G-Ready’.

India is known both for its strong Mapping and Space programs. Apart from Survey of India, which is responsible for topographical mapping, a number of national mapping organizations like GSI, FSI and NHO have been undertaking thematic mapping & charting in various cartographic disciplines. Today, data from the Indian Remote Sensing Satellites is being widely used all over the world for a variety of applications.

Survey Of India is the forerunner of G-Readiness in India and the leader in adopting Digital Cartography – initially as an R&D activity and subsequently by establishing

Digital Mapping Centres. The first Digital Mapping system was installed by Rolta and Intergraph at SOI in 1988. This had a VAX host and provided the complete workflow – from map scanning and digitisation, to image processing, map publishing and the creation of a Digital Cartography Data Base.

This was a major step taken by the Government and the 10 Million-Dollar installation was the first important initiative for making India ‘G-Ready’. In subsequent years, other nodal agencies including State Governments have proceeded towards ‘G-Readiness’ – by installing and utilising Digital Cartography and GIS systems. For example, Central Water Commission has implemented a System, across 31 sites, for collating, storing and querying hydrological data to more effectively manage the country’s water resources; while organisations like Gujarat Pollution Control Board have integrated their MIS and GIS for administering, monitoring and enforcing environmental statutes in the State of Gujarat.

The armed forces, especially the Indian Army, have moved significantly ahead in making themselves ‘G-Ready’ and use GIS as a force-multiplier in their operations. An Army Commander’s dependence on paper maps and sand models for operational planning and dissemination of these plans has been replaced by the latest GIS tools. These tools permit dynamic visualisation of a 3D terrain model for seamless access, query and analysis across multiple types of military geographic data. Mapping and analysis is done using satellite imagery and aerial photography of the target area. High performance scanners, capable of scanning a long roll of aerial film, un-attended, are being effectively used in capturing oblique photography for stereo analysis, while in the area of satellite remote sensing, both stereo and monoscopic data are being handled. These systems, provided by Rolta and Intergraph, have been deployed, both in a static mode i.e. they are installed at a permanent site and in a mobile mode

meaning that ruggedised systems housed in specialised shelters have been mounted on trucks to move as required.

This 'G-Readiness' has given a tremendous boost for improved tactical logistics in the forward areas as both strategic and tactical reconnaissance data can be efficiently interpreted in a war-like situation, as experienced during the recent border deployments called "Operation Parakaram".

In the area of Public Utilities, 'G-Readiness' using the technology of AM/FM & GIS has come to be recognized as an effective solution for managing large telecom, electric and gas distribution networks. Rolta also pioneered the induction of this technology in the country.

There are many similar examples of 'G-Readiness' through the successful implementation of GIS technology in India. This is a direct result of extraordinary efforts and commitment shown by these pioneering organizations. They have led the way through their forward-looking vision and are today role models for others looking to become 'G-Ready'.

It is apparent that GIS has come of age and Geomatics is going mainstream. Today, GIS technology is building on the widely deployed IT infrastructure – using, adapting and extending available tools and standards. GIS is no longer a tool for the specialist - it's a decision making tool for the management.

Organisations, today, need to have just-in-time actionable information - just the right information, at the right time, at the right location, on any device - with which they can make effective decisions and take immediate action.

The vast global information service infrastructure that has now emerged on the backbone of the Internet connects most offices, and will in all likelihood, connect

vehicles, mobile handsets, PDAs and other devices, together in a gigantic web of information producers, service providers and consumers. The global information infrastructure may depend on computers, networks and software, but the main ingredient is spatially referenced information. In this scenario, while the traditional methods of becoming 'G-Ready' continue to be relevant, new areas will continue to emerge. For example, Public Safety Agencies are now appreciating the benefits of being 'G-Ready', as Automated Vehicle Location and Emergency Dispatch enables them to respond to public needs much faster and more efficiently. Better management of natural and manmade disasters, has also assumed critical importance. Being 'G-Ready' can be very helpful in planning for evacuation, emergency medical assistance, food and civil supplies.

In its new avatar, 'G-Readiness' has also started to contribute significantly to e-Governance. For example, various forward-looking Nagar Nigams and Municipalities are becoming 'G-Ready' for undertaking effective town planning, maximising tax collections, detecting illegal constructions, and so forth.

Though India has one of the largest 'Higher Education Systems in the world' it still needs to greatly improve the availability of 'G-Ready' professionals, a pre-requisite for G-readiness. At the post-graduate level, institutions like the Indian Institute of Remote Sensing, Survey Training Institute, the Institute of Remote Sensing, to name a few, are doing a commendable job in providing courses at professional / post-graduate levels in GIS and associated disciplines. However, GIS as a course needs to get increasingly incorporated at the undergraduate level in various engineering programmes, due its multi-disciplinary nature. It will be worthwhile to mention here to promote the learning and usage of this technology, Rolta, in partnership with Intergraph, provides software and its implementation at very highly subsidised prices to educational institutions.

The last five years have seen increasing usage of the Internet. The World Wide Web is being used more and more by public, governments, and commercial organizations to disseminate information of spatial nature. This is encouraging the spread of 'G-Readiness' whereby the Internet is acting as a medium that allows the community to query and manipulate information and submit their ideas on spatial problems to those with the power to enact solutions.

In order to reap the benefits of 'G-Readiness' availability of spatial data is a must. Initiatives like the National Spatial Data Infrastructure (NSDI) are timely and I am confident that the required policies would be worked out, which would facilitate effective sharing and access of digital spatial data, within the norms of national security.

To conclude, many organisations, across the country, are today 'G-Ready' and effectively using GIS in a wide variety of applications. As usage and applications grow, the increasing 'G-Readiness' in India will result in more effective e-Governance for public welfare.

Thank you, and wish you all a fruitful conference.