Mumbai Free Map

Proposal for
Community Geographic Information Systems (GIS)
in the Mumbai Metropolitan Region

By Shekhar Krishnan, Anirudh Paul and Prasad Shetty
Mumbai, October 2004 to March 2005

Proposal Abstract

The Mumbai Metropolitan Region is one of Asia's largest cities, in which urban spaces are the central arenas of political imagination and intervention. The past decade has seen the articulation of a new politics of space in Mumbai — through the contesting claims of the urban poor majority in slums and squatter settlements, assertive residents' associations and civic reform movements, the prosperous construction industry and builder-politician nexus, and concerned practitioners in the design, architecture and research professions. In spite of this increased awareness and concern with urban spaces, basic information on housing, land, infrastructure and environment — the right of citizens — remains largely inaccessible, because of bureaucratic obstacles and vested interests. This asymetry of information has given rise to predatory classes of builders and speculators, whose privileged access to information is transformed into "development rights" for construction, eroding accountability to local communities and urban stake-holders, and the planning policies meant to uphold their rights. Existing applications of new spatial technologies such as geographic information systems (GIS) for commercial services or scientific research remain distant from the needs of these grass-roots communities and local decision-makers. With the increasing demands of citizens for their rights to information on urban space — and recent legislative enactments and public interest litigation on freedom of information — we feel that communities can harness the power of new geo-spatial imaging and mapping technologies to strengthen their demands for secure tenure and housing rights, open and vibrant public spaces, and ecological conservation and sustainable development in the mega-city. This proposal outlines a project to develop an open-access spatial data infrastructure, and a set of simple tools and applications in localised in Indian languages, for knowledge transfer and participatory urban planning by communities and citizens in Mumbai, and other global cities in the Asia-Pacific region.

Project Proposal

Through this project, CRIT seeks to integrate GIS and other networked mapping and spatial imaging technologies into our existing infrastructure and research practice, enhancing our projects and interventions through the use of Internet technology and networks.

The key objectives and outcomes of this project are:

The creation of an online **open-access spatial database and base map** of key areas within the Mumbai Metropolitan Region, on the cumulative basis of the urban research, design and development studies and interventions conducted over the past six years by the CRIT Members, with our partner organisations and stake-holders in Mumbai. This will be deployed through a **web-based geographic information system (GIS)** for local communities to use for their own mapping, planning and development needs and aspirations, with the base map forming a platform for public dissemination and intervention. The key areas of the city for which we plan to develop the base map — based on our existing record of work in these areas — are the Western Suburbs, the Inner City, the Post-Industrial Landscapes, and the Metropolitan Periphery of Mumbai (for more information about and a list of these projects, see Annex A).

The development of a set of simple, cross-platform and Unicode-compliant **spatial tools and mapping applications in English and localised in Hindi and Marathi,** to enable participation of communities, citizens, and stake-holders in spatial planning and decision-making in Mumbai and other global cities in the Asia-Pacific region. These tools will be developed by CRIT and the project team through visualising communities' own needs for information housing, land, infrastructure and environment.

The deliverable results of this project include making the base map, tool sets and source code (herafter referred to as the "platform") freely available online, as well as through a self-booting 'live' CD through which the platform can be used and modified on a computer desktop with or without Internet access, in English, Hindi and Marathi. The online (web) and offline (live CD) platform will include examples of work from CRIT mapping projects where we already have data and documentation, and will include simple how-to explanations and tutorials for how to make your own maps.

Project Stake-Holders and Areas of Focus

We seek support for the development of a set of simple and localised spatial tools and applications for stake-holders to create and maintain their own community maps and databases of their localities, neighbourhoods and settlements. These community stake-holders — the prime beneficiaries of the project — represent diverse and often competing interests in the key areas of the city in which we work, from state authorities to residential associations to slum communities and grass-roots activist groups. The project seeks to develop a GIS-enabled and web-based public platform for these various stake-holders and the public to access and produce spatial information of crucial relevance to urban development in the four key areas of the Mumbai Metropolitan Region in which we have worked:

In the **Inner-City of South Mumbai,** the platform will assist residential and slum communities in claiming their right to quality housing, sanitation, and civic services, and security of land tenure and development rights, by allowing them to visualise the redevelopment potential of their housing and land assets, and assess the impact on local infrastructure and environment of the rampant and ill-planned construction activities currently transforming the area. The platform will also permit the documentation of structures and spaces for heritage conservation in Central Mumbai. CRIT has previously worked with the Municipal Corporation of Greater Mumbai in Kamathipura-Kumbharwada-Khetwadi and the Mancherji Edulji Joshi Colony Residents' Asssociation in Dadar-Matunga-Wadala, and is currently working with the Slum Rehabilitation Society and the Heritage Conservation Society of the Mumbai Metropolitan Region Development Authority (MMRDA) in Mumbai Central and Mahalaxmi the Inner-City.

In the **Post-Industrial Landscapes of Central Mumbai,** the platform will assist state planners, labour activists, architects, heritage conservationists, port authorities and company managements to visualise and plan for urban regeneration and integrated redevelopment of the historic textile mill districts and port areas. The Mill Lands and Dock Lands — the two largest continguous land holdings in the city — have seen an extensive spatial restructuring in the past twenty years, with the decline and closure of manufacturing and shipping activities, the evacuation of large factories and the industrial waterfront, and the large-scale retrenchments of working class populations. The platform will assist in visualising the use of these lands for public spaces, social housing, local institutions and employment generation. CRIT has previously worked with the Girangaon Bachao Andolan (Movement to Save the Mill Districts), and is currently working with the Urban Design Research Institute (UDRI) and the Eastern Waterfront Task Force of the Government of Maharashtra in the Mill Lands and Dock Lands.

In the **Western Suburbs of North Mumbai,** the platform will be utilised by residential communities and local civic associations to continuously document, monitor, and keep vigilance over the open commons and public spaces which are currently threatened and contested by elite private interests, encroachers and the builder-politician nexus. With the ratio of open space per person in Mumbai one of the lowest of any large metropolis in the world, public space is one of the central arenas of conflict in the city. The platform will allow citizens to propose and assess political and design interventions to safeguard the open, non-exclusive and cosmopolitan character of these designated common spaces, and ensure their continued public access for recreation, sport, leisure and community activities, against the concerted efforts to enclose and privatise them. CRIT has previously worked in Bandra Reclamation with the General A.K. Vaidya Nagar Residents' Association, and has its studio and office in Goregaon-Malad in the Western Suburbs.

In the **Metropolitan Periphery north of Greater Mumbai,** the platform will provide a basis for for local rural communities, tribal cooperatives and activists, and district and village authorities to negotiate the rapid and unbalanced development of these peri-urban regions, and their appropriation by city-based interests in the construction and tourism industries. The serious threat posed to sensitive ecologies and built environments by urbanisation — existing community-based systems of water and land management, the conversion of agricultural lands to urban uses, and the increasing migration from the city and other parts of the country — is largely unrecognised in the land-use and development plans for these regions proposed by state authorities in these "greenfield" sites. CRIT has worked with the Collectorate of Thane District in the Akloli, Ganeshpuri and Vajreshwari region, and is currently working with the the Heritage Conservation Society of the Mumbai Metropolitan Region Development Authority (MMRDA) and the Vasai-Virar Arakhada Kruti Samiti (Action Committee for Planning in Vasai-Virar) in the Vasai-Virar Sub-Region of the Metropolitan Periphery.

In addition to these ongoing projects and initiatives in Mumbai, we have continuing relationships with the Muncipal Corporation of Greater Mumbai, the Maharashtra State Government, the Mumbai Metropolitan Region Development Authority, and the Collectorate of Thane District. We have also received expressions of interest in our work from the All-India Institute of Local Self Government in Mumbai, the Maharashtra State Election Commission, and the government administrative academy Yashada in Pune.

Project Methodology

As a collective of architects, artists, designers, social scientists, and technologists concerned with the city, we feel that inter-disciplinary collaboration is essential to research and intervention, and we are committed to working across sectors and institutions to articulate a public debate on the representation and dissemination of spatial information through the proposed GIS platform. In our six years of work with local communities, state authorities, and civic groups on urban design, research and development projects, our ultimate aim — of skill and knowledge transfer to stake-holders — has often proven elusive. Mostly published in printed form and privately circulated, our projects started as static representations of a fast-changing urban environment, with a normative bias towards immediate problem-solving and crisis resolution. The form and method of our urban projects — in spite of our commitment to participatory, action-oriented research and public dissemination — thus often ended up addressing our stake-holders as passive participants or consumers of the spatial information which we produced. This project reflects our desire to shift the form and method of our research towards a more dynamic and networked use of spatial information, where the stake-holders are themselves the producers and owners of the information, to which they have a right as citizens. The platform described above has the potential to unlock new means of dissemination and interaction within and among urban communities, enhancing their participation in development and planning processes, and reclaiming an urban imagination dominated by elitist and exclusive visions of the city's development.

Project Time-Line

The proposed time-line of the project is 24 months, from May 2005 to May 2007. This is divided into a schedule of four six-month phases of activity:

May to November 2005. Acquisition, collation and indexing of all material from earlier CRIT projects, supplemented by archival maps, satellite and remote-sensing imagery, land survey records, development plans, and other forms of non-spatial social and economic data, and community information such as interviews and site photography. Team research into hardware and software choices, proprietary versus free software solutions, and the present state of the GIS industry in India. Preparation for development of base map.

December 2005 to April 2006. Vectorisation and digitisation of spatial and non-spatial information and creation of master GIS database of Inner City, Post-Industrial Landscapes, Western Suburbs, and Metropolitan Periphery projects. Installation of server and networked infrastructure to support development of base map, in collaboration with technicians and programmers. Preparation for development of community GIS tools.

May to November 2006. Completion of the base map and online beta distribution of the master GIS database created in the previous phase. Convening of workshops with communities and stake-holders to introduce the platform, and receive feedback and suggestions on the programming of customised applications in relation to local developmental priorities, community aspirations and interests, and technical feasibility. Debugging and trouble-shooting of base map and beta distribution of community GIS tools.

December 2006 to May 2007. Completion of application development and distribution to communities, public demonstration of the full platform, and interaction with stake-holders and user groups on potential future interventions enabled by the GIS base map and mapping tools. Launch of network of community mapping nodes on the basis of existing project stake-holder groups, to promote further use and development of the platform in the Mumbai Metropolitan Region and throughout the Asia-Pacific.

CRIT will also organise community mapping workshops in Mumbai with software developers, architects and urban designers, educators and community activists at the conclusion of the first

two phases and at the conclusion of the *third* and *fourth* phases — a total of three intensive workshops — to test the platform in a real-time setting and solicit feedback on usability, interface design, and facilitate planning and support for further phases of the project.

About CRIT

CRIT (Collective Research Initiatives Trust) is a group of architects, scholars, technicians and artists who have worked together over the past seven years in Mumbai. CRIT was founded in February 2003 with the aim of undertaking research, pedagogy and intervention on contemporary cultural and spatial practices in the Mumbai Metropolitan Region. CRIT regards this vast urban realm as its laboratory and terrain for articulating a critical urbanism. Our understanding of urbanism is based on the recognition that everyday exchange between disciplines and across sectors is the basic condition of metropolitan environments, and that collective research is essential to transforming urban spaces and civic life.

This project is premised on our group's record and experience over the past six years in working with state municipal and regional planning bodies, peer NGOs and research cells, residents associations in middle-class and slum communities, and local social movements in the Mumbai Metropolitan Region. CRIT (Collective Research Initiatives Trust) was founded by the former members of the Design Cell of the Kamala Raheja Vidyanidhi Institute of Architecture and Environmental Studies (KRVIA), to carry forward the multi-disciplinary projects begun in 1997 by the Design Cell, towards documenting and intervening in the rapidly changing urban landscapes of a globalising mega-city.

For more information on our organisation, see http://www.crit.org.in . For our certificate of registration as a charitable trust in the State of Maharashtra, see Annex B and http://www.crit.org.in/official — where you can download our latest audited accounts, certificates of incorporation and tax exemption, and other official documents.

ANNEX: List of CRIT Projects

mumbai's metropolitan periphery

- **Akloli, Vajreshwari and Ganeshpuri Tourism Development Plan (2004)**
  Supported by the Collectorate of Thane District
- **Vasai-Virar Sub-Region Conservation Plan (2004)**
  Supported by the Heritage Conservation Society of the MMRDA (Mumbai Metropolitan Region Development Authority) and the Vasai Vikas Arakhada Nagari Kruti Samiti

mumbai's western suburbs

- **Urban Archaeology: Mahakaali Caves (2004)**
  Proposed to the Heritage Conservation Society of the MMRDA (Mumbai Metropolitan Region Development Authority)
- **(Re-)Defining Public Spaces: Open Recreation Ground at Bandra Reclamation (2003–2004)**
  Supported by the General Arun Kumar Vaidya Nagar Residents' Association

mumbai's post-industrial landscapes

- **Industrial Museum Collaboration: Mumbai's Mill Lands (2003–2004)**
  Proposed to the India Foundation for the Arts (IFA)
- **Mumbai's Port and Dock Lands (2002–2004)**
  Supported by the UDRI (Urban Design Research Institute) and the Eastern Waterfront Task Force, Government of Maharashtra

mumbai's inner city

- **Redevelopment of Betwala Chawl at Foras Road (2004)**
  Supported by the Slum Rehabilitation Society
- **Kamathipura-Kumbharwada-Khetwadi Precincts (2003)**
  Supported by the Municipal Corporation of Greater Mumbai (MCGM)
- **Five Gardens: Conservation of Dadar-Matunga-Wadala Precincts (2001–2004)**
  Supported by the Mancherji Edulji Joshi Colony Residents' Association (MEJCRA)
- **Development Right (2002–2004)**
  Supported by the Heritage Conservation Society of the MMRDA (Mumbai Metropolitan Region Development Authority)

curatorial projects and exhibitions

- **IMAGECITY: Formal and Informal Networks (2003)**
  Curated by Gustavo Ribeiro at the Royal Danish Academy of Fine Arts, Copenhagen
- **Century City: Art & Culture in the Modern Metropolis – Bombay/Mumbai, 1992–2001 (2001)**
  Curated by Ashish Rajadhyaksha and Geeta Kapur at the Tate Modern, London

print and web publications

- *Tactical City: Tenali Rama & Other Stories of Mumbai's Urbanism*
  Multimedia Novel supported by the SARAI Fellowship Programme
  http://crit.org.in/archives/tactics
- *Revival of Kamathipura-Kumbharwada-Khetwadi Precincts* **(2004)**
  Published by the Municipal Corporation of Greater Mumbai (MCGM)
- **Public Space Diary (2003)**
  Published for the General Arun Kumar Vaidya Nagar Residents' Association

Project Coordinators and Resource Persons

Prasad Shetty is an architect and urban researcher who completed his B.Arch from the Kamala Raheja Vidyanidhi Institute of Architecture, University of Mumbai (2001) and his Masters in Urban Management from the Institute for Housing and Urban Development Studies, Erasmus University, Rotterdam (2003) — where he received a distinction for his thesis on urban community information systems, titled "Gossip and the City". He is a partner of Co-Lab, an architectural practice in Asmara, Eritrea, where he is involved in housing and tourism projects. He was core Faculty at the Kamala Raheja Vidyanidhi Institute of Architecture (KRVIA), and Coordinator of the KRVIA Design Cell (1999–2002), the research and consultancy wing of the institute, during which he was involved in numerous heritage conservation, housing, and urban redevelopment projects, which have continued through CRIT, of which he was a Founding Trustee and is Executive Member. His interests are in urban planning and management, community-based interventions, and digital archiving and mapping. For more information see http://www.crit.org.in/members/prasad

Shekhar Krishnan is a social scientist and independent researcher who completed his B.S.F.S. in Culture and Politics from Georgetown University, Washington DC (1998) and his M.A. in South Asian Studies from the School of Oriental & African Studies, University of London (1999). Apart from being an Executive Member of CRIT, he works as researcher-consultant with the Srishti School of Art, Design & Technology, Bangalore, is also partner-consultant with MAHITI Infotech, Bangalore, and is Visiting Faculty at the Kamala Raheja Vidyanidhi Institute of Architecture (KRVIA), Mumbai. He was the founding Coordinator then Associate Director of PUKAR (Partners for Urban Knowledge Action & Research) (2001–2003), and was the Founder and Joint Convenor of the Mumbai Study Group at the Academy of Architecture, Mumbai (2000–2002). His interests are in urban history and geography, social theory, new media practice, digital archiving and publishing. For more information see http://www.crit.org.in/members/shekhar

Anirudh Paul is an architect and urban designer who completed his B.Arch from Bengal Engineering College, Calcutta (1990), and his M.Arch in Urban Design from the School of Planning and Architecture, New Delhi (1993). He is presently Acting Director of the Kamala Raheja Vidyanidhi Institute of Architecture (KRVIA), Mumbai, where has has been Deputy Director (2000–2002) and Coordinator of the KRVIA Design Cell (1995-2000). He is an Executive Member and Founding Trustee of CRIT. His interests are in architectural theory, urban design and planning, community-based interventions, and the history and formation of technical and educational institutions in the city. For more information see http://www.crit.org.in/members/anirudh

Jitendra Shah is a senior scientist, and professor at the Victoria Jubilee Technical Institute (VJTI), Mumbai, currently on deputation to C-DAC (Centre for the Development of Advanced Computing), Mumbai, for localisation of free and open source software interfaces in Indian languages, and software development, deployment and community-building. He is a member of the Expert Committee on Computerisation of the Government of Maharashtra, in-charge of projects to digitise and convert to Unicode-based format various government documents, gazetteers, and voter registration records. He is the Convenor of the IndicTrans Team, a non-profit group committed to the development and free distribution of Hindi, Marathi, and Gujarathi interfaces and educational software (http://www.indictrans.org). He has been a

research fellow at the Indian Institute of Technology (IIT) Bombay, and the Centre for Monitoring the Indian Economy, Mumbai, and has taught computing programming and engineering for more than twenty years. His interests is in enhancing the quality and promoting freedom of education to both rural and urban areas through the use of affordable information technologies.

Kiran Jonnalagadda is a writer and programmer who works at the crossing of media, technology and the web. He led the team that built the Human Protein Reference Database at the Institute of Bioinformatics, Bangalore and Johns Hopkins University, Baltimore (2002–2004), has trained programmers at Mahiti Infotech, Bangalore (2001–2005), has been a technology writer with *Chip* magazine (1999) and continues to contribute to various technology publications. He is currently a consultant software architect with Partecs Participatory Technologies, Pune (headquartered Rome, Italy), and a Research Fellow of the SARAI New Media Initiative at the Centre for the Study of Developing Societies, New delhi (2005), studying how user interfaces affects online communities. He is also a member of the Plone Foundation and a trustee of the Tapovan Academy, which runs the Tapovan ICSE school in rural Bangalore.

Schuyler Erle is a freelance hacker based in London, U.K. He has worked for O'Reilly and Associates, and has co-written the NoCat Authentication system, one of the earliest and still widely used open source captive portal packages. He is the co-author, with Rich Gibson and Jo Walsh, of Mapping Hacks (http://www.mappinghacks.com), which will be published by O'Reilly in summer 2005. He currently pursues consultancy in open source GIS with an emphasis on design and popular usability, grass roots political and humanitarian action, and sustainable development. He has been involved with Rich Gibson on the NoCatMaps project, with Jo Walsh on the London Free Map and the University of Openness Cartography Department, and with Shekhar Krishnan and CRIT in developing the project presented in this proposal. He is affiliated to the Srishti School of Art Design and Technology, Bangalore/Mumbai, where he conducted an interim semester workshop on locative media in January 2005, and through which he will return to India to pursue collaborations in July 2005.

Jo Walsh is a freelance hacker and software artist based in London, U.K. She started out building web systems for the Guardian, ICA (Institute of Contemporary Arts) and state51 in London, and she now works with the semantic web, spatial annotation, and bots. She is the co-author, with Rich Gibson and Schuyler Erle, of Mapping Hacks (http://www.mappinghacks.com), which will be published by O'Reilly in summer 2005. She heads the University of Openness Cartography Department at the Limehouse Town Hall in London. Her interests are in mapping, wireless geo-location, public transport planning and urban geography. She is affiliated to the Srishti School of Art Design and Technology, Bangalore/Mumbai, where she conducted an interim semester workshop on locative media in January 2005, and through which he will return to India to pursue collaborations in July 2005. For more information, see http://space.uo.frot.org and http://www.frot.org