

# Book of Abstracts



SEARCH  
searchtrust.org



RCGSIDM  
IIT Kharagpur

SEARCH in collaboration with Ranbir and Chitra Gupta School  
of Infrastructure Design and Management, IIT Kharagpur presents

## Search Workshop 16

# LANDSCAPE URBANISM

21-27 December, 2016 | Kolkata, India



## **Blue-Line Public Places...**

Kolkata's original canal (Khal in Bengali) network, the backbone of the drainage system in the city for about three centuries, has deteriorated over the years. Unchecked growth and related land-fill, lack of periodic maintenance, poor management of waste-water & solid waste are few of the reasons. Kolkata suffered terrible water-logging for over a week in September 2006. Situation has been better since then, yet there are lots to be done. Besides that, most of these water channels and large drains are stinking, dirty and unhygienic negative spaces within the city.

The workshop recognizes potentials of these drains/ nullahs/ canals, and, taking inputs from multi-disciplinary intellectual exchanges, shall explore Ideas and Proposals to convert such unused spaces into environmentally sustainable and socially appropriate public places and mobility corridors.

# Contents

---

## 1 Introduction

## 2 People

Advisors  
Mentors and Speakers  
Coordinators  
Participants  
Organisers

## 6 Programme Schedule

---

### *Author's Bio and Presentation*

## 12 Joy Sen

Role of Trans-municipal governance in Landscape Urbanism (LU) within a Metropolis: An inclusive Policy of Settlement Dynamics in India

## 14 Dhrubajyoti Ghosh

East Kolkata Wetlands: A Global Tutorial for Sustainable Living

## 16 Suptendu Biswas

Introduction to Search Workshop 16

## 18 Sobhanlal Bonnerjee

Canals & Related Possibilities of Urban Development in Kolkata

## 20 Chandrima Sinha

Ecology of Canals & Water system in Kolkata

## 22 Suchandra Bardhan and Souporni Paul

Landscapes of Kolkata

## 24 Samiran Datta

Reshaping City Negative Spaces: An Alternative Approach

- 26 **Rupali Gupte**  
'Trips, Kicks and the City lived' -- Concepts for Engaging with the City
- 28 **Prasad Shetty**  
'Mechanics of Compassions' -- Concepts of Engaging with the City
- 30 **Triptendu Prakash Ghosh**  
Urban Infrastructure Financing and the PPP Model
- 32 **Rahul Nargas**  
West & Lower Don Lands and Etobicoke Creek Revitalization – Learning from Greater Toronto Area
- 34 **Kallol Basu**  
Laws on Environment and the role of the Judiciary in India
- 36 **Kalyan Mukhopadhyay**  
Traffic of Kolkata and Use of Canals to Tackle Traffic Problems: a Futuristic View
- 38 **Vina Verghese**  
Revitalisation of Derelict Opens Spaces - Bundh Rejuvenation & Eco-Restoration of Urban Forest in Gurgaon, NCR

..... ***More Bios - Mentors and Speakers***

- 40 Shubhrajit Das  
Anjan Mitra  
Subroto Niyogi  
Saurabh Tewari  
Arkopal K. Goswami  
Rajesh Advani
- 42 Abhimanyu Prakash  
Subhadip Biswas  
Sudeshna Mitra

## People

---

### Advisors

**Ar. Dulal Mukherjee,**

Architect, Kolkata

**Dr. Suptendu P. Biswas,**

Architect, Urban Designer and Planner, New Delhi

**Prof. (Dr.) Joy Sen,**

Architect and Planner, HoD: Ranbir and Chitra Gupta  
School of Infrastructure Design and Management (RCG-  
SIDM), IIT Kharagpur

**Prof. Aneerudha Paul,**

Director, Kamla Raheja Vidyanidhi Institute of Architecture,  
Mumbai

**Ar. Anjan Mitra,**

Architect and Urban Designer, Kolkata

### Mentors and Speakers

**Prof. (Dr.) Joy Sen,**

Architect and Planner, HoD, RCGSIDM, IIT Kharagpur

**Dr. Suptendu P. Biswas,**

Architect and Urban Designer, Visiting Faculty at SPA Delhi

**Prasad Shetty,**

Architect and Urbanist, Co-Founder CRIT and Faculty at  
SEA Mumbai

**Anjan Mitra,**

Architect and Urban Designer, Kolkata

**Dr. Dhrubajyoti Ghosh,**

Wetland Conservator and Activist, Kolkata

**Prof. Shubhrajit Das,**

Architect and Professor at Jadavpur University, Kolkata

**Rahul Nargas,**

Urban Designer, City of Brampton, Ontario, Canada

**Prof. Samiran Datta,**

Head, Satyajit Ray Film & Television Institute, Kolkata

**Vina Verghese,**

Landscape Architect, New Delhi

**Dr. Suchandra Bardhan,**

Landscape Architect, Professor at Jadavpur University, Kolkata

**Rupali Gupte,**

Architect and Urbanist, Faculty at SEA Mumbai

**Saurabh Tewari,**

Architect and Assistant Professor at SPA Bhopal

**Dr. T.P Ghosh**

Economist, Asst Professor at IIFT Kolkata

**Rajesh Advani,**

Architect and Founder Director of Architecturelive.in

**Prof. Subroto Niyogi,**

Civil Engineer, Kolkata

**Abhimanyu Prakash,**

Architect and Urban Planner, Associate at NACTO, New York

**Kallol Basu,**

Legal Expert on Environmental Issues, High Court, Kolkata

**Dr. Chandrima Sinha,**

Urban Ecologist, Kolkata

**Subhadip Biswas,**

Advocate, Kolkata

**Dr. Arkopal Goswami,**

Civil Engineer and Assistant Professor at RCGSIDM, IIT Kharagpur

**Coordinators**

**Saurabh Tewari,**

Architect and Assistant Professor at SPA Bhopal

**Subhadip Biswas,**

Advocate, High Court, Kolkata

**Dr. Arkopal Goswami,**

Faculty at RCGSIDM, IIT Kharagpur

**Rajesh Advani,**

Architect and Founder-Director: ArchitectureLive!

## Participants

---

### **Young Professionals**

Akriti Kacker, Lucknow  
Ankita Sehgal, Bengaluru  
Anubha Madhav Joshi, Pune  
Anusha Ranganathan, Bengaluru  
Apeksha Jain, Agra  
Chaitanya Dang, Raipur  
Esha Kundu, New Delhi  
Moumita Banik Mou, Dhaka  
Nipun Prabhakar, New Delhi  
Paridhi Jain, Bhopal  
Vanya Pandey, Lucknow

### **Young Faculty Members**

Enam Rabbi Adnan, Dhaka  
Honey Jalali, Manesar  
Parul Vyas, Vadodara  
Tazrin Islam, Dhaka

---

### **PG Students**

Ahmed Yousuf Khan, BUET Dhaka  
Deepshikha Bhattacharyay, SPA Bhopal  
Kavita Dhanuka, SPA Bhopal  
Khandoker Tariqul Islam, BUET Dhaka  
Laha Priyandri, SPA Bhopal  
Nivedita Patel, SPA Bhopal  
Nupur Soni, SPA Bhopal  
Pragati Prasoon, SPA Bhopal  
Rahul Das, SPA Bhopal  
Ruksana Afroz, BUET Dhaka  
Rupamita Bose, CEPT Ahmedabad  
Shireen Anwar Hossain, SPA Delhi  
Udday Shankur Datta, BUET Dhaka

### **UG Students**

Abrar Ali, CA Trivandrum  
Arun Kuthanazhi, BIT Ranchi  
Debmalya Ghosh, JU Kolkata  
Lakshya Jain, SPA Bhopal  
Nishat Subah Peau, Dhaka  
Roshan K.S.S., JNAFAU Hyderabad  
Shuvo Datta, BUET Dhaka  
Sonal Jaiswal, MBSSPA Delhi  
Surbhi Agrawal, SPA Bhopal  
Utkarsh Kumar Singh, BIT Ranchi  
Varun Bhakhri, KRVI Mumbai  
Vikramaditya Singh Rathore, SPA Bhopal  
Vidhi Wadhawan, SPA Bhopal  
Vivek Rakotu, JNAFAU Hyderabad

## Organisers

---



SEARCH

[searchtrust.org](http://searchtrust.org)

### **SEARCH**

**[www.searchtrust.org](http://www.searchtrust.org)**

SEARCH is a charitable non-profit trust registered in India to promote activities of excellence in the fields of built environment and related spheres. The team includes eminent professionals, mainly architects, planners and designers, from Delhi, Kolkata and several places across the globe. The Trust intends to collaborate to impart socially nuanced and technologically appropriate knowledge-generation in Architecture, Planning, Design, Urban Studies and related realms. SEARCH has already organized a number of successful symposiums in Kolkata and New Delhi and partnered with industry leaders and top academic institutions like, AA School, London and Zaha Hadid Architects, London to hold the last international workshop on Digital Architecture.



**RCGSIDM**  
**IIT Kharagpur**

### **Ranbir and Chitra Gupta School of Infrastructure Design and Management Indian Institute of Technology Kharagpur**

**[www.iitkgp.ac.in/rcgsidm](http://www.iitkgp.ac.in/rcgsidm)**

The Ranbir and Chitra Gupta School of Infrastructure Design and Management has been started by Indian Institute of Technology Kharagpur in the year 2008 as a result of the joint initiative of the institute and Mr. Ranbir (Ron) Singh Gupta, an alumnus (1970 batch B.Arch, IIT Kharagpur) of this Institute. Mr. Ranbir Gupta, who is the founder and chairman of SIGMA7 design group, New York has made an endowment through Ranbir and Chitra Gupta Foundation to promote the initiative.



### Lead Sponsor

**Terre Armée**

**[www.terre-armee.com](http://www.terre-armee.com)**

**New Delhi | Kolkata | Mumbai | Bengaluru**

Over the last 50 years, Terre Armée has been setting the gold standard in reinforced earth structures and has played an active role in over 50,000 projects around the world. All Terre Armée technologies are suited to a broad array of structures, including Retaining walls, Bridge abutments, Dikes and embankments, Underpasses, Cut-and-cover tunnels, Arch bridges and reinforced embankments. Terre Armée is committed to pursuing a policy of continual improvement in a bid to achieve operational excellence. Sharing skills and knowledge is also an integral part of the company's philosophy.



### Co-sponsor

**Infinity Infotech Parks Ltd.**

**[www.infinityitpark.com](http://www.infinityitpark.com)**

**Kolkata**



### Knowledge Partner

**VSPB Associates**

**[www.vspbassociates.com](http://www.vspbassociates.com)**

Architects | Urban Designers |  
Landscape Architects | Planners

**New Delhi**



### Online Partner

**ArchitectureLive**

**[www.architecturelive.in](http://www.architecturelive.in)**

**New Delhi**

## DAY 1 | DEC 21, Wednesday

Time	Duration (min)	Activity Time Breakup (min)		Topic	Person/s
		Presentation	Q & A		
0900-1000	60	BREAKFAST			
1000-1045	45	INAUGURATION			
1045-1130	45	30	10	Role of Trans-municipal governance in Landscape Urbanism (LU) within a Metropolis: An inclusive Policy of Settlement Dynamics in India	Prof. (Dr.) Joy Sen
1130-1215	45	30	10	East Kolkata Wetlands: A Global Tutorial for Sustainable Living	Dr. Dhruvajyoti Ghosh
1215-1245	30	20	10	Introduction to the Workshop	Dr. Suptendu P. Biswas
1245-1330	45	--	--	<b>STUDIO WORK</b> (Project Familiarity)	Mentors
1330-1430	60	LUNCH BREAK			
1430-1830	240	--	--	<b>SITE VISIT</b>	Mentors
1830-1900	30	TEA BREAK			
1900-1930	30	20	10	Canals & related possibilities of urban development in Kolkata	Ar. Sobhanlal Bonnerjee
1930-2000	30	20	10	Ecology of Canals & Water system in Kolkata	Dr. Chandrima Sinha

## DAY 2 | DEC 22, Thursday

Time	Duration (min)	Activity Time Breakup (min)		Topic	Person/s
		Presentation	Q & A		
0800-0900	60	BREAKFAST			
0900-0945	45	30	10	Landscapes of Kolkata	Dr. Suchandra Bardhan
0945-1030	45	30	10	Reshaping City Negative Spaces: An Alternative Approach	Prof. Samiran Datta
1030-1330	180	--	--	<b>STUDIO WORK</b>	Mentors
1330-1430	60	LUNCH BREAK			
1430-1500	30	20	10	Bike/Pedestrian Integration into Urban Public places	Dr. Sudeshna Mitra
1500-1830	210	--	--	<b>STUDIO WORK/ SITE VISIT</b>	Mentors
1830-1900	30	TEA BREAK			
1900-1930	30	20	10	'Trips, Kicks & the City Lived' -- Concepts of Engaging with the City	Ms. Rupali Gupte
1930-2000	30	20	10	'Mechanics of Compassions' -- Concepts of Engaging with the City	Mr. Prasad Shetty

## DAY 3 | DEC 23, FRIDAY

Time	Duration (min)	Activity Time Breakup (min)		Topic	Person/s
		Presentation	Q & A		
0800-0900	60	BREAKFAST			
0900-0945	45	30	10	Financing Strategies for Urban Projects	Dr. TP Ghosh
0945-1030	45	30	10	West & Lower Don Lands and Etobicoke Creek Revitalization: Learning from Greater Toronto Area	Mr. Rahul Nargas
1030-1330	180	--	--	<b>STUDIO WORK</b>	Mentors
1330-1430	60	LUNCH BREAK			
1430-1500	30	20	10	NACTO experiences: Lessons from Urban Street Design	Mr. Abhimanyu Prakash
1500-1530	30	20	10	Canals of Kolkata: Legal issues of Land, Infrastructure & Governance	Mr. Subhadip Biswas
1530-1830	180	--	--	<b>STUDIO WORK</b>	Mentors
1830-1900	30	TEA BREAK			
1900-1930	30	20	10	Legal concerns on Environmental Issues	Mr. Kallol Basu
1930-2000	30	-	-	Traffic of Kolkata and Use of Canals to Tackle Traffic Problems: a Futuristic View	Mr. Kalyan Mukhopadhyay

## DAY 4 | DEC 24, SATURDAY

Time	Duration (min)	Activity Time Breakup (min)		Topic	Person/s
		Presentation	Q & A		
0800-0900	60	BREAKFAST			
0900-0945	45	30	10	Revitalization of derelict open spaces: <i>Bundh</i> Rejuvenation & Eco-restoration of Urban Forest in Gurgaon, NCR	Vina Verghese
0945-1030	45	30	10	Waste Water Management	Industry Expert
1030-1330	180	--	--	<b>STUDIO WORK</b>	Mentors
1330-1430	60	LUNCH BREAK			
1430-1800	210	--	--	<b>STUDIO WORK</b>	Mentors
1800-1830	30	20	10	Sponsor's Presentation	Terre Armee
1830-1900	30	TEA BREAK			
1900-2000	60	--	--	Informal Discussions	Mentors

---

## DAY 5 | DEC 25, SUNDAY

---

Time	Duration (min)	Activity Time Breakup (min)
0800-0900	60	BREAKFAST
0900- 1300	180	<b>CITY TOUR</b>
1300-1400	60	LUNCH [DURING CITY TOUR]
1400-1600	120	<b>CITY TOUR</b>
1600-1700	60	TEA BREAK
1700-2000	180	GROUP WORK

---

## DAY 6 | DEC 26, MONDAY

---

Time	Duration (min)	Activity Time Breakup (min)
0800-0900	60	BREAKFAST
0900- 1330	270	<b>FINAL PRESENTATION/ REVIEW</b>
1330-1430	60	LUNCH
1430-1700	150	<b>Incorporating Comments in Drawings</b>
1700-1730	30	TEA BREAK
1730-2000	150	<b>Incorporating Comments in Drawings</b>

---

## DAY 7 | DEC 27, TUESDAY

---

Time	Duration (min)	Activity Time Breakup (min)
0800-0900	60	BREAKFAST
0900- 1330	270	<b>Conclusion of Exhibition Drawings</b>
1330-1430	60	LUNCH
1430-1700	150	<b>Conclusion of Exhibition Drawings</b>
1700-1730	30	TEA BREAK
1730-1930	120	<b>Conclusion of Exhibition Drawings</b>
1930-2000	30	Valedictory

---

**#Note: The Schedule is subject to last minute modifications.**

### SUMMARY

<b>Studio</b>	<b>34 hr. 45 min</b>
<b>Lecture/Talk</b>	<b>11 hr. 30 min</b>
<b>Site Visit</b>	<b>7 hr. 30 min</b>
<b>City Tour</b>	<b>5 hr.</b>

---

# **Presentation Abstracts**

---

**with Speakers' Bio**

## Joy Sen



Dr. Joy Sen is a Professor of Indian Institute of Technology, Kharagpur, West Bengal, India. He is currently Head of Ranbir and Chitra Gupta School of Infrastructure and Design, IIT Kharagpur (2014 – 2017). His areas of research are Community and Regional Planning Analyses & Programming and Architecture and Planning related Heritage Studies and Documentation. He has a long working experience with the various Environmental Design programs. DAT (Development Aid Team) based workshop projects under the ISU-UNDP program (1987-89) at Iowa State University, USA; Metropolitan Environmental Management Projects under DFID Government of United Kingdom (1995-96); and projects related to Sustainability researches under OECD and IR3S (2011-12) in the University of Tokyo, Japan, are just to name a few.

He has his Bachelor's Degree in Architecture (Hons.) and Ph.D. from the Indian Institute of Technology Kharagpur and the Master's Degree in Community and Regional Planning from College of Design, Iowa State University, Ames, Iowa. He was awarded the Board Silver Medal in Social Sciences from CBSE/NCERT, New Delhi obtaining highest All-India marks; Institute Silver Medal from IIT Kharagpur for All-round performance; Best Master's Thesis Award (1989) from ISU, Ames, USA. Joy has specific aptitude in culture studies, History of the Arts and Indian Music (Instrument; Sitar).

## Day 1 Morning

---

### Role of Trans-municipal governance in Landscape Urbanism (LU) within a Metropolis: An inclusive Policy of Settlement Dynamics in India

---

1045-1130

Indian Metropolitan Cities are experiencing rapid urbanization affecting the distribution, degree and intensity of vacant, green, waterbody networks and forest outgrowth lands (VGWF-OL) across their spaces. Two major issues are evident. Firstly, there is the relative and uncontrolled decentralization in the metropolitan periphery affected by a mushrooming of high-end affordable housing systems; and these systems are backed up by Transit oriented corridors and rising car ownerships. At the same time, in the city core areas, there are unprecedented rates of urban compaction leading to deterioration in quality of life as the availability of livable green environment is fast withering off. In the absence of an integrated policy in metropolitan economic growth, the resultant is an uncontrolled sprawl that is detrimental to the required density of VGWF-OL. Secondly, the plight is compounded as a poly-nucleated form of conurbation or urban explosion continues to aggravate the transition in intensity of built development misbalancing a smoother transition in the distribution, degree and intensity of VGWF-OL.

In effect, rising land prices and built sprawls along axes of poly-nucleated development having an overrated emphasis on automobile oriented planning and a least emphasis on green corridors. It renders the metropolitan periphery environmentally unsustainable. The paper emphasizes that Inclusive Landscape Urbanism can be an integrated land use and transport policy intertwined with green corridors of varied VGWF-OL around and along multiple urban nodes across mass transit lines and corridors. Indian metropolises therefore need a very important leverage through an all-inclusive trans-municipal approach in Landscape Urbanism. The objective is to integrate urban infrastructure planning and transport policy by implementing a LU policy across the networks of VGWF-OL through cross-balancing poly-nucleation of spaces and inclusive trans-municipal networking in governance. It holds a better way to re-organize our Indian metropolises by re-designing the urban landscapes considering the axes of trans-municipal governance of VGWF-OL.

## Dhrubajyoti Ghosh



Dr. Dhrubajyoti Ghosh is the only person in the world to have established the local ecological knowledge of the community in treating the city wastewater and did away with the expenditure for setting up a conventional sewage treatment plant for Kolkata. He discovered the outstanding community knowledge of the local people who grew fish, vegetables and paddy. As one of the earliest engineers to have done doctoral research in Ecology in the seventies, he used his subjective tool to re-understand and spread awareness about an unknown wetland ecosystem remarkable for its diverse ecosystem services. He became a UN Global 500 Laureate for this work in 1990, and recently received the Luc Hoffman award for his conservation work in the East Kolkata Wetlands.

Besides many journal publications and monographs, Dr Ghosh has written two books. While the first one described the traditional ecological knowledge of the East Kolkata Wetlands (Ecology and Traditional Wetland Practice) the second one expounds a post-Cartesian approach in knowing ecology and ecosystem management, largely as a knowledge of the ordinary. His forthcoming book is on the community of waste recyclers in Kolkata, to be published by the Oxford University Press. He has recently been honoured as Taiwan's wetland conservation advisor by the Govt. of Taiwan.

## Day 1 Morning

---

# East Kolkata Wetlands: A Global Tutorial for Sustainable Living

1130-1215

The definition of an ecosystem is evolving and lacks the robust characterization and classification a 'watershed' has. There was a time when an urban slum could not be classified as an ecosystem – having a natural-biological artifact was a compulsion. Things are changing, both in terms of theory and the structural definition of ecology and ecosystems or ecosystem management. Today social artifacts such as a city, a village or a marketplace are as much an ecosystem as a pristine island or a mangrove forest. The supremacy of East Kolkata Wetland lies in the fact that it is a tutorial ecosystem – as a natural-biological reactor and at the same time as a political-cultural ensemble on the edge of a major metropolitan city. We are learning on two accounts. Simultaneously.

The recorded history of the wetland in question starts in 1981, when it was named, and subsequently mapped 1985. It became a site of international importance in 2002 when it was accorded the Ramsar tag – the only one in India to be evaluated essentially for its wise use criteria. In fact, the East Kolkata Wetlands is one of the 17 case study sites listed by the Ramsar authority on tutorial ecosystems for learning more about wise use of ecosystems.

The present paper discusses the areas of learning an ecosystem's functions and services in the context of sustainable living – When living relates to that of the local inhabitants inside the wetlands and metropolitan population the wetland serves and subsidises ecologically.

## **Suptendu Biswas**



Dr. Suptendu P. Biswas is an architect, urban designer, and planning professional involved in teaching, research, and consultancy. He is a graduate from B.E. College (IEST), Shibpur, and is a postgraduate and doctorate from the School of Planning and Architecture (SPA), New Delhi. He works on built environment, urbanism, spatial equity, and sociology of culture. His recent book, *Assorted City*, on equity, justice and politics of urban services has received critical appreciation. He is also a recipient of the National Scholarship from Government of India and Senior Fellowship from Ministry of Culture, Government of India.

## Day 1

### Afternoon Introduction to Search Workshop 16

---

1215-1245

The workshop begins with an observation that the age-old canal system of Kolkata has deteriorated due to multiple factors like, unchecked growth, lack of maintenance, poor management of waste-water & solid waste among others. As a result, canals itself and spaces alongside, both, have become 'stinking, dirty and unhygienic negative spaces' in the city. However, an underlying optimism believes that such spaces can contribute positively to the city by being 'blue line public places'. This presentation explains the broad outline of the workshop by defining its concept, context and the working methodology.

## **Sobhanlal Bonnerjee**



Sobhanlal Bonnerjee, an architect and town planner, had studied and worked in India & Europe and taught as a visiting faculty of IEST .

Commissioned by WBSTC, he undertook a study of canals of Kolkata and presented his ideas in 1994. Since then, he has further developed his ideas and made presentations in many national & international seminars.

## Day 1 Evening

# Canals & Related Possibilities of Urban Development in Kolkata

---

- 1900-1930
- Kolkata Metropolitan Region is excellently endowed with waterways. The total length of which is a staggering 1700 Kms.
  - Most of these are natural waterways either branches or tributaries to the Ganga which not only forms the spine of this vast waterways system but also the binding thread of the small & big urban and semi urban settlements giving a unique “string-of-beads” form to Kolkata Metropolis.
  - Thus while the waterways are basic to Kolkata’s urban form, these are now the ugliest parts due to long misuse and abuse.
  - Kolkata’s regeneration therefore is intricately linked with restoration and renovation of these waterways.
  - Renovation of waterways in Kolkata, or in any urban settlement, is linked to sustainable use & functions specially designated to them.
  - In Kolkata Metropolitan area, these functions traditionally covered mainly Drainage & Transportation, besides the social use. These were very effectively used for supply of water both for civic & industrial use. While the civic uses may save the huge cost the Industrial uses may give a planned direction to Metropolitan growth, including resurrection of the Riverfront by providing alternative sites for the age-old industry.
  - Waterways are primarily meant to be ‘Ways’. For sustainable use of waterways for transportation the Origins & Destinations, existing and/or planned, of the designated traffic are to be identified and linked effectively.
  - Fortunately the waterways in Kolkata connect such ‘O’s & ‘D’s which are broadly, the Industrial areas, the newly developing areas, wholesale markets, railway yard & ports.
  - Apart from providing for a fuel-efficient transport and consequently a big reduction of the carbon footprint, waterways have five great qualities from the environmentalists’ point of view. It provides a contrast, and thus relief from monotony of built-up space. It creates barriers and thus helps to maintain the identity of habitations. It supports aquatic bio diversity. It offers opportunities of developing linear parkways penetrating deep into town. It influences Micro-climate around it and offers pleasant recreational spaces. The Waterways of Kolkata offer excellent possibilities of giving the Metropolis a unique form, special look and better environment.

## Chandrima Sinha



Chandrima Sinha is a Ph. D in Ecology and Environmental Science. She is having 20 years extensive research experience on wetland conservation, biodiversity conservation, fisheries management and livelihood management. She was involved in several projects on Wetland management and sustainable development in different states of India. She was also instrumental in development of several Wetland Management Plans and had exposure to work with Ministry of Environment and Forest, several State Governments, international funding agencies and NGOs. She is having 6 years of teaching experience. Presently, she is a consultant in SEED (Society for Socio Economic and Ecological Development).

## Day 1 Evening

# Ecology of Canals & Water system in Kolkata

---

1930-2000

Kolkata was a colonial city developed by British East India Company 325 years ago. Presence of water connectivity through river, creeks and natural canals in Calcutta became an important trading center in the British India. For navigation of trader's boats with commodities, further new canals were excavated, dredged or widened. A number of hydraulic structures were developed to control the water-flow especially during the high tides. Initially city drainage was planned to discharge in river Hooghly, which was against the slope and contaminated drinking water. Later a correction in planning took place and an underground drainage system was constructed for disposal of waste water to Salt Lake and further pushed towards Bidyadhari and Matla river system. Later, these canals were used for carrying storm water for flood control and waste water towards eastern part of the city through Salt Lake and then further pushed towards Bay of Bengal. With the growth of population in city, the role of the canals have been changing over the years-- from navigation, they have been reduced to become carriers of sewage and storm waters of the city only. There are eight major canal systems or khal in and around the city, Circular Canal, The Bagjola Khal, Kestopur Khal, Tolly's Nala, Tollygaunj- Panchannagram system, Municipal drainage system (DWF and SWF), Manikhali and Churial system. Municipal drainage channels (DWF and SWF) are passing through East Kolkata Wetlands and nutrient rich water are entering in fisheries (bheri) through several feeder canals. These channels are finally discharging water to Kulti River. Water quality of these canals show completely anoxic condition and with high BOD and COD indicating unsustainable aquatic life. Increasing encroachments on the canal banks and their slopes, extension of human settlement in the low lying fringe areas of the city, is another alarming factor for deterioration of water quality and drainage congestion in the city.

## Suchandra Bardhan



Prof. Suchandra Bardhan is an architect with specialization in Landscape Architecture. She is currently Head of Department of Architecture at Jadavpur University, Kolkata. She has a PhD (Engineering), M. Landscape Architecture from SPA Delhi and B. Arch from Jadavpur University, Kolkata. With interest in both academics and practice, she has undertaken some major research/project works on heritage, environment and landscapes. With active participation in National and International Conferences, she also has a substantial number of journal and proceeding publications to her credit. She has won several awards and honors during her academic career.

## Souporni Paul



Souporni Paul has more than 6 years of experience in Architecture, Interior design, Landscape design and Master Planning Projects. After graduation from Jadavpur University, she completed her Masters in Landscape Architecture from SPA, New Delhi. She has handled diverse project types ranging from private residences to townships, large scale public projects, canals and lakefronts. She has three years of teaching experience and presently a research scholar under Dr. Bardhan.

## Day 2

### Morning

## Landscapes of Kolkata

---

0900- 0945

Kolkata (previously Calcutta) is the capital of West Bengal and chief commercial, financial and manufacturing center of eastern India. India's second most populous city and one of the largest metropolitans of the world, Kolkata is home to about 4.5 million people in core Kolkata and 14 million people within the extended metropolitan region. According to the 2011 census Kolkata district has a population density of 24,252 inhabitants /Sq Km. Located within the floodplains of lower Gangetic delta, Kolkata is naturally endowed with lush tropical landscape with river, canals, wetlands & waterbodies. Geographically, Kolkata was mostly a swampy land, considered to be an extension of Sundarbans, before the British amalgamated the three villages of Gobindopur, Sutanuti and Kolikata in 1690 to form their trade centre and later the capital of British India. The early 1920s mark a major phase of urban planning with the Calcutta Improvement Trust (now KIT) acquiring about 192 acres of marshy jungles to develop the area for residential use – improving roads, creating lakes and parks. Today, the Maidan, urban & neighbourhood parks and large lakes form significant components of the urban landscape of the city. Another natural feature that contributed for its present shape is the extensive canal network, which enabled trade in the early 19th century but is the main carrier for sewage and storm water at present. The natural marsh formation on the eastern fringe namely the East Kolkata Wetland is a Ramsar Site, unique for its waste-water fed aquaculture system and serving the key functions of providing food, sanitation and livelihood in the city. These natural and man-made landscape elements not only articulated the urban growth but also play a major role in the infrastructure, provide ecosystem services, preserve natural habitat and fulfils the recreational need of the residents.



## Samiran Datta

Prof. Samiran Datta is currently heading the Department of Cinematography at Satyajit Ray Film and Television Institute, Kolkata. An alumni of Film and Television Institute Pune. Samiran Datta has got more than ten fiction feature films to his credit as Director of Photography along with several Documentary, short film etc. Films shot by him have been showcased in leading international film festivals including Venice, Rotterdam, Moscow and Chicago. Four films shot by Samiran has got national award as best film in India and Bangladesh. His nonfiction works has been showcased in BBC, NGC, CNN and YLE Thema. 'Meherjaan' a fiction feature on Bangladesh war of independence has won him best cinematography award in Hobocan international film festival, USA. The same film has also bagged accolade award for excellence [USA] for best cinematography. Beyond Cinema and Cinematography Samiran has a keen interest in installation art and new media art.

## Day 2 Morning

# Reshaping City Negative Spaces: An Alternative Approach

---

0945-1030

Ever wondered if Neeta of Ritwik Ghatak's 'Meghe Dhaka Tara' comes to rehabilitate in Kolkata today where would she manage to put up herself? Journey of man kind has been a long story of migration. Disaster whether created by nature or mankind itself has and is till date uprooting and thus forcing a part of us across the globe to occupy the grand central station platform or even the banks of dirty sewage canal. The sea is carrying corps of refugee kids upto the shore. On the other hand in this age of global economy as Partha Chatterjee points out in his scholarly article -Are Indian cities becoming bourgeois at Last? - "the growth of the new metropolis is fundamentally characterised by a shift from industrial manufacturing to a service-dominated urban economy...there are new segregated and exclusive spaces for the managerial and technocratic elite...government policy has rapidly turned away from the idea of helping the poor to subsist within the city and is instead paying the greatest attention to improving infrastructure in order to create conditions for the import of high technology" It is in this context,taking primarily the east Kolkata canal side slums as reference this digital-photo essay tries to provoke policy makers and town planners to consider assigning spaces for refugee camps while planing a future city.

## Rupali Gupte



Rupali Gupte is an architect and urbanist practicing and teaching in Mumbai. Her work often crosses disciplinary boundaries and takes different forms – writings, drawings, mixed-media works, storytelling, teaching, conversations, walks and spatial interventions.

Her works include research on housing, mobility, sanitation, post-industrial landscapes, urban villages, informal settlements and housing typologies in Mumbai. A large body of her work is about investigations on new methodological frameworks to understand contemporary urbanism. She works extensively on community housing, design and planning projects for various communities.

She has a wide range of publications and has worked / taught / delivered lectures and exhibited across the world. In 2004, she co-founded an urban research network, CRIT ([crit.in](http://crit.in)) and in 2014, an experimental academic space, SEA ([sea.edu.in](http://sea.edu.in)).

## Day 2 Evening

# Trips, Kicks and the City lived -- Concepts for Engaging with the City

---

1900-1930

The presentation will discuss the urban form of Mumbai towards formulating the logic through which it gets generated.

The contention of the paper is that cities are formally complex, experientially intense and have logics that are incoherent. They fold spaces, practices and relationships together to create an enormous, perpetually morphing urban form. This morph is characterized by unclear geographies, absurd lives, unstable forms and a coexistence of sharp contradictions within it. The formulations around grand-narratives of globalization, corporate capitalism, neo-liberalism, informalisation, poverty etc; or deficiency-stories of housing and infrastructure shortage, environmental decay and corrupt governance are inadequate to comprehend the morph. How does this morph work? What keeps it in a state of perpetual transformation? What are the sources of its energies? The stories from Mumbai offer an agile framework to discuss the complexities, intensities and incoherence of the morph.

The presentation will make three propositions to understand cities and the energies with which they operate.

## Prasad Shetty



Prasad Shetty is an urbanist based in Mumbai. He has studied architecture (Mumbai) and urban management (Rotterdam). He currently teaches at the School of Environment and Architecture (SEA) and also works with the Mumbai Metropolitan Region – Environment Improvement and Heritage Conservation Society. He is one of the founder members of the urban research collective; CRIT and the Society for Environment and Architecture.

**Day 2  
Evening**

**'Mechanics of Compassions' --  
Concepts of Engaging with the City**

---

1930-2000

At the core of many urban readings/engagements today is a call for 'collective compassion'. In these readings/engagements most instances of 'change' are rendered as 'disruption'; instances of 'intensity' are spoken about as 'congestion' and 'disorder'; instances of 'differences' are referred as 'shortage'; and experiences of 'work' are described as 'exploitation'.

Through a discussion on the mechanics of compassion, this presentation will argue three things: first that 'collective compassion' (which is essential in shaping the urban realm) is a produced idea; second that the production of collective compassion requires mobilisation a particular language ; and third, this compassion feeds from an ethic rooted in religion and family, but mediated through a hyper-media context. These are currently preliminary ideas from the work in progress around the mechanics of compassion.

## **Triptendu Prakash Ghosh**



Dr. Triptendu Prakash Ghosh holds M.A from Jawaharlal Nehru University and Ph.D from Jadavpur University He has worked in banks and financial institutions for about six years, handling areas like asset-liability management, risk management, infrastructure financing, and policy analysis. He is currently Assistant Professor at Indian Institute of Foreign India. His areas of interest includes subjects (for teaching) and/or areas (for research) like Financial Management, Derivatives and Risk Management, Fixed Income Securities, Infrastructure Financing, Securities Analysis & Portfolio Management, Excel Spreadsheet Modeling in Finance, Performance and Corporate Governance of Family Firms, Financial Markets and Institutions.

## Day 3 Morning

# Urban Infrastructure Financing and the PPP Model

---

0900- 0945

For financing urban infrastructure (and other infrastructure), PPP is often the first and at times the last priority in developing countries like India. However, attempts to build infrastructure using the PPP model is often made without properly realizing the suitability of this model. In this paper, we briefly review the evolution and the conceptual weaknesses of this model first, and then note that there is no alternate source of financing available to the urban bodies in a country like India making application of PPP inevitable. Next we discuss the various contractual forms and financing structures followed in building infrastructure using this model. Finally, we trace the evolution of the process of involving private capital in financing urban infrastructure in India, document its successes and limitations, conjecture about its future course. Throughout the paper, we remain focussed to financing urban infrastructure though at times we draw references from financing of other infrastructure facilities as well.

## Rahul Nargas



Explorer of cities, architect and an urban designer, Rahul strives to build bridges across disciplines, scales and cultures. Born and raised in Delhi, a city known for its functional anarchy and contradictions he continues to learn from places and cities he encounters. As an urban designer with a City of Brampton and resident of Toronto he continues to advocate the role of place making, active transportation and transit.

Rahul has worked on a variety of projects including large scale master plans, mixed-use developments, urban revitalization plans, streetscape design in Canada and globally. He has contributed to several urban design guidelines, and was the recent recipient of ULI Toronto's 2016 winning entry. As a avid city explorer, he can usually be found planning his next urban exploration walk at St. Lawrence market, Toronto on Saturday mornings.

## Day 3 Morning

### West & Lower Don Lands and Etobicoke Creek Revitalization – Learning from Greater Toronto Area

---

0945-1030

Landscape Urbanism and New Urbanism are one of the few paradigms which aim to define the current urban theory and practice. This article describes that in the course of declaring the relevance of their urbanist theory both these movements define the city and its processes in narrow terms. The more traditional role of planning which aims for social equity, access to urban land, civic services and amenities cannot be supplanted by a purely design based approach, whether it is landscape or built form. While there are substantial points of departure between Landscape Urbanism and New Urbanism, there are examples in which these defining theories have intersected and contributed to city building. They have adapted to include social equity and fairness in their visions thus venturing beyond design and capturing the attention of decision makers and planners.

The presentation identifies two case studies to explore the evolution of Landscape Urbanism and New Urbanism principles in the Greater Toronto Area (GTA), specifically West and Lower Don Lands Revitalization in the city of Toronto and Etobicoke revitalization in the city of Brampton.

The study area for West and Lower Don Lands is situated adjacent to the financial core of the City of Toronto. While a substantial part of the revitalization and subsequent development has been delivered, the second and final phase is yet to start. The second case study is located in a suburban setting, in the City Brampton. This study is currently in planning stage with an upper riparian study and environment assessment scheduled for 2017. In conclusion, this article argues that cities are complex, they change and adapt creating synergies to be successful. These synergies are important in a rapidly urbanizing world where there are competing priorities for land, energy, food and water.

## Kallol Basu



Kallol Basu is a legal Practitioner at the High Court at Calcutta and a known environmental law professional. He has also taught as a visiting faculty at the Department of Environment, Jadavpur University. He completed the integrated 5 year LLB course from Calcutta University in 1995 and subsequently got enrolled with the Bar Council of West Bengal as an Advocate. His practice domain primarily includes Civil matters, Constitutional Writ matters and Environmental litigations. Over the years, he has represented several public authorities including West Bengal Board of Secondary Education, West Bengal Pollution Control Board, District Primary School Council, The Reserve Bank of India; Hindustan Petroleum Corporation Limited, The High Court at Calcutta (for High Court Administration), CONCOR (a government of India undertaking).

## Day 3 Evening

# Laws on Environment and the role of the Judiciary in India

---

1900-1930

Concern for the environment teaches us that the very existence of humans on the earth is absolutely dependent on that of other living creatures, organisms and non-living elements. Unfortunately, environmental ignorance and arrogance, both, make us think that our supremacy does not depend on anything other than ourselves. As a result, we tend to cause harm to non-human organisms and elements of the earth, rather recklessly. Environment related legal issues, therefore, gain importance requiring certain solidarity and friendship between science and law. Interestingly, in times of crisis, when failures of the Parliament in keeping accountability to the people and corresponding disabilities of the Executive come to the light, the Judiciary makes us realize that we have been on a journey from environmental ignorance to environmental arrogance. In our country, the Parliament took many years to understand the importance of framing apt legislations pertaining to the issue of environment. For instance, the Bhopal Gas Leak case ultimately forced the Parliament to enact the legislation of the Environment Protection Act, 1986.

The Supreme Court, indeed, has emerged as a messiah in the matter of creating new horizons for environmental jurisprudence. The moral courage and subtle wisdom of the Court has also been able to force the Parliament as well as the Executives to implement certain provisions of the directive principles of state policy. Directive principles of state policy are not justiciable, but are fundamental in governance. The Supreme Court in dealing environmental issues reminded the Parliament that same cannot be a political exhortation. Often, the thin line between the fundamental rights and the directive principles of state policy has consciously been blurred by the Supreme Court in order to keep its commitment to the constitutionalism alive. On many occasions, not the consciousness of the Parliament, but the cerebral alertness of the Judiciary has enabled this country to survive and respond to environmental issues and concerns. In this regard, it may be interesting to illustrate here, how certain judgements of the Judiciary in India became examples when the subtle combination of wisdom and personality of a judge could ensure justice, and not the letters of law.

## **Kalyan Mukhopadhyay**



Kalyan Mukhopadhyay, IPS , a post-graduate in physics, started his career in Police Administration in the year 1995. He served as the Subdivisional Police Officer in the sub divisions of Barasat, Bishnupur, Chandannagar and Durgapur and then as Superintendent of Police in Malda.

As DC Traffic Barrackpore he helped in complete overhauling of the traffic system of Barrackpore and introduced participatory traffic management system by the active use of social media.

Presently, in his capacity as DC Traffic South of Kolkata Police, he has infused fresh blood in the system through systematic upgradation of traffic system in the added areas of Kolkata.

**Day 3  
Evening**

**Traffic of Kolkata and Use of Canals to  
Tackle Traffic Problems: a Futuristic View**

---

1930-2000

The presentation is a discussion on the present and apprehended problems of vehicular traffic in Kolkata in view of the expansion of the city beyond its present limit and with the increasing vehicular pressure on the near constant motorable roadways.

For the purpose of analysis, projections and inferences, available data and appropriate statistical tables have been used. The study attempts to focus on the evolution of the city of Kolkata over the last 300 years, spatially and demographically, along the intensive canal network system and draws a parallel with similar such cities and towns which have used the waterways successfully for addressing and in improving the vehicular traffic movement. The existing canal system, their reach and the associated problems have also been discussed in brief.

The study also tries to point out the potentials of the canals network and the way it can be used to the advantage of the traffic movement of Kolkata. The possibility of using these canals to improve traffic in Kolkata and the prospect of coming challenges are described from the experience in this field.

## Vina Verghese



Vina Verghese Biswas is an architect and landscape architect based in New Delhi. She is a graduate from IIT, Kharagpur with a Masters degree in Landscape Arch. from SPA, Delhi. She has been involved in various scales of architectural, urban design and landscape practice as one of the two partners of M/s VSPB Associates since 1995. She is also presently in the visiting faculty in the Dept. of Landscape Architecture at School of Planning and Architecture, Delhi. She has also taught at the Dept. of Architecture at School of Planning and Architecture, Delhi and at Sushant School of Art & Architecture, Gurgaon for the Thesis Semester. She is also in the panel of Examiner for GGS IndraPrastha University, Delhi.

## Day 4 Morning

### Revitalisation of Derelict Opens Spaces - Bundh Rejuvenation & Eco-Restoration of Urban Forest in Gurgaon, NCR

---

0900- 0945

Across the world, several projects are aimed at rebuilding derelict urban environments to transform and rejuvenate marginalized places into vibrant public spaces for the city. The revival of such neglected spaces can serve to energize urban landscapes and create healthy environments for outdoor leisure for city dwellers. An eco-friendly project was initiated, by a Gurgaon based NGO, to rejuvenate a Bundh, which was historically used as a check dam in a water collection/ retention system. The 5.2 km long stretch of Bundh along a nullah, starting at Chakarpur village and ending at Sec-56, crosses three main east-west roads and runs parallel to two busy north-south roads in Gurgaon. Presently used as a dumping ground and for open defecation by the surrounding slum dwellers, this long stretch of forest land, in the midst of high-end residential housing enclaves, lies in a sad state of misuse!

A Design Proposal was drawn up to create a Public Place and Eco-mobility Corridor in the form of a Linear Park, with walking and cycling tracks providing non-motorized linkages through the city. This would promote pedestrian movement as well as cycling as an environment friendly movement system for short distance travel from one part of the city to another. This forest corridor would also create a 'green lung' for Gurgaon and provide a natural setting for leisure facilities to the adjoining residential areas. The proposal offers barrier-free access to the differently-abled visitors (including the visually impaired) and provides an effective gated system that restricts the entry of motorized bikes. A short 200m stretch, in front of Paras Hospital, was taken up as a Pilot Project for implementation and this has been a successful model for revival of a derelict stretch of Bundh, in a Forest land cutting through the prime areas of the city. This linear park offers non-motorized linkages for alternative modes of circulation and will soon turn into a hotspot for recreation in the city.

## Speakers and Mentors

---



**Shubhrajit DAS** is a reputed academician based in Lucknow, Delhi and Kolkata. He is presently Professor at the Department of Architecture of Jadavpur University, Kolkata. He received the Graduation in Architecture, School of Architecture, CEPT Ahmedabad (with one term in ETH, Federal Institute of Technology, Zurich, Switzerland) and M.S in Architecture from University of Cincinnati, Cincinnati, USA. He has been involved in a reputed architecture practice based in Lucknow. He taught as a Professor at the Govt. College of Architecture, Lucknow, and as a visiting faculty at the School of Planning and Architecture in New Delhi.



**Anjan Mitra** has been involved with architecture and urban development as a researcher, a practitioner and an activist. A gold medallist in Urban Design, he has also bagged the National Award in Housing Competition, Star Hotel Projects in Delhi. He emerged as a winner in Renovating Star Theatre Competition. Throughout his career he advocates for sustainable design. He is involved in various research studies involving urban development, urban economics, conservation and cultural issues.



**Subroto Niyogi** has a unique combination of expertise-- a post graduate degree in Architecture from University of Texas at Austin, USA and graduate degree in Civil Engineering from Jadavpur University, Kolkata. He taught at University of Texas at Austin. He has worked in top design firms in the USA and in India. His areas of expertise and interests are wide in scope and scale, including large high rise high end residential complexes, upscale single family residential developments, commercial, hospitality and specialized constructions.



**Saurabh Tewari** is an Assistant Professor of Architecture at School of Planning and Architecture Bhopal. At present, he is pursuing doctoral studies at Design Programme, IIT Kanpur. A B. Arch from Sushant School of Art and Architecture, Gurgaon and then M.Des from IDC IIT Bombay, he has presented his work in various universities and academic events in India, Sri Lanka, Germany, Portugal, Qatar, Denmark, Turkey etc. His research interests lie in design, its history, modernism and India.



**Arkopal K. Goswami**, PhD is an Assistant Professor in the RCG School of Infrastructure Design and Management, IIT Kharagpur. He received his Masters' and PhD in Civil Engineering from the Uni. of Virginia, USA and has over 8 years of experience in the field of transport infrastructure planning and management. He has authored technical documents, published in peer-reviewed international journals and has also presented his work at various international conferences.



**Rajesh Advani** completed his architecture in 1997 from university of Pune and currently doing his research on Walkability as a part of Urban Design Thesis from Rajasthan technical University. He also founded ArchitectureLive! in 2011, the platform for architecture and designer community. he has conducted several workshops on the use of Information Technology and Building Information Modeling in architecture with NIASA (CoA) and architecture colleges.



**Abhimanyu Prakash** is a Program Associate at NAC-TO-Global Designing Cities Initiative. As an urban designer (GSAPP, Columbia University) and architect (SSAA, Gurgaon), he has gained global expertise in these fields through his past engagements in India, Germany and New York City. He is also involved as a junior board member at Asia Initiatives, New York, and at Dakshini Prayash, Kolkata, helping these NGO's with their community projects in varying capacities.



**Subhadip Biswas** is a third generation advocate having his own practice in the High Court, Calcutta in the field of Civil, Property & Real Estate, Corporate, Constitutional (Education & Service), Industrial & Labour, Arbitration, Intellectual Property Rights, Debts Recovery and Consumer Protection disputes. He is one of the two founder partners of M/s LEX GLOBAAL, a legal consultancy firm in Kolkata and New Delhi.



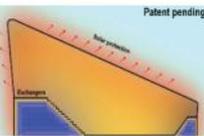
**Sudeshna Mitra**, is a Phd in Civil Engineering (Transportation) from ASU, USA. Dr. Mitra is an Associate Professor at the Civil Engineering department of IIT Kharagpur. Her research has primarily been focused on Transportation Safety, Sustainability Design, Statistical Econometric modeling of transport data and she has published original works in the area of road traffic safety and econometric modeling of crash data. Since 2009 her research focus has been on various transportation related issues facing India, such as road and rail safety, design for non-motorized transport and traffic operations in heterogeneous traffic.

## Notes

# Notes



# Notes



Patent pending



TERRE ARMEE

Leaders in Innovation and Technology  
RETAIN / CROSS / PROTECT

# Integrating Innovative Engineering Solutions



## Our Business Lines

Terre Armee in India (Reinforced Earth India) provides innovative technology by integrating engineering solutions in the field of Hydraulics, Environment, Geo-Techniques and Pre-Cast Structures.

Our business model is based on providing specialty services through cost efficiency, optimized design, engineering value-add and construction methods management. Our experienced engineers, superintendents and technicians supervise site activities and ensure construction quality.

**RETAIN**  
RETAINING STRUCTURES & SOIL REINFORCEMENT

- Reinforced Earth<sup>®</sup>
- Composite Earth<sup>™</sup>
- Precast Retaining Wall ~ T-Wall<sup>®</sup>
- TechWall<sup>®</sup>
- TerraLink<sup>™</sup>
- TerraNail<sup>®</sup>
- TerraAnchor<sup>™</sup>

**CROSS**  
CROSSING STRUCTURES

- TechSpan<sup>®</sup>
- TechBox<sup>™</sup>
- TechCulvert<sup>™</sup>
- TechAbutment<sup>®</sup>

**PROTECT**  
PREVENTING & PROTECTING INFRASTRUCTURES

- Slope Retention
- Avalanche Barriers
- Rock Fall Protection
- Debris Flow Control
- Industrial Risks Protection
- Erosion Protection
- Coastal Defence
- River Training

### Reinforced Earth India Private Limited

E 11 • Block B-1 Extension (Opposite NTPC Badapur)  
Mohan Co-operative Industrial Estate • Mathura Road • New Delhi 110044  
phone +91 11 4645 7600 - 7601 • fax +91 11 4645 7630  
email reinforcedearth@terrearmeeindia.com • web terre-armee.com

New Delhi | Kolkata | Mumbai | Bengaluru



## Sustainable Technology

A SUBSIDIARY OF SOLETANCHE FREYSSINET

## Blue-Line Public Places...

Kolkata's original canal (Khal in Bengali) network, the backbone of the drainage system in the city for about three centuries, has deteriorated over the years. Unchecked growth and related land-fill, lack of periodic maintenance, poor management of waste-water & solid waste are few of the reasons. Kolkata suffered terrible water-logging for over a week in September 2006. Situation has been better since then, yet there are lots to be done. Besides that, most of these water channels and large drains are stinking, dirty and unhygienic negative spaces within the city.

The workshop recognizes potentials of these drains/ nullahs/ canals, and, taking inputs from multi-disciplinary intellectual exchanges, shall explore Ideas and Proposals to convert such unused spaces into environmentally sustainable and socially appropriate public places and mobility corridors.



**Search Workshop 16**  
**LANDSCAPE URBANISM**  
**21-27 December, 2016**  
**IIT Kharagpur CEP Centre**  
Sector-III HC Block, Salt Lake City  
Kolkata, India  
[www.architecturelive.in/searchworkshop](http://www.architecturelive.in/searchworkshop)

Lead  
Sponsor



Co-Sponsor



Knowledge  
Partner



Online  
Partner

