28–29 August 2015

Research Division Seminar Room, AS7 06-42
The Shaw Foundation Building, Faculty of Arts and Social Sciences
National University of Singapore

This workshop has the following objectives: (a) it seeks to advance a dialogue between STS scholars and critical social scientists on the meanings and forms of infrastructure. In addition, (b), it seeks to bring historical and contemporary studies of infrastructural projects into dialogue with theoretical discussions that foreground the intersection of the social and the material; (c) it seeks to contribute to the still-nascent discussion of the intersections of social and material infrastructures in Asia.

Historians, especially historians of technology, have long been concerned with the material origins of modern and urban life, an interest that has led to intensive studies of particular infrastructures – e.g., water, roads, electricity grids, transport systems – especially in the West (e.g., the classic study by Hughes, 1983). STS-oriented scholars among their ranks have sought to explore the multiple intersections of the social and the material in infrastructures, with a particular emphasis on breaking down the assumed inanimate and non-human ontologies of the material and natural respectively (e.g., Latour 1993). While this approach has been both productive and theoretically innovative, questions of hierarchy, cultural division, social marginality and political exclusion have not always been central to this scholarship (with the notable exception of Donna Haraway, 1991, among others).

In recent years, anthropologists and human geographers have transported the idea of infrastructure well beyond its familiar meaning -- the material underpinnings of economic life and the modern habitus -- by extending its conceptual reach to the social and cultural (Star 1999). This move has led to a number of important conceptual innovations, notably the articulation of social interactions and networks as forms of contingent and disembodied infrastructure (Elyachar 2010; Robbins 2007; Simone 2004). Infrastructure as a social space and condition has been read variously as strategic modes of coping and resilience, the production of new publics, and the ubiquity of informal structures that dwarf the legible world. Notwithstanding the value of extending the concept of infrastructure beyond its material origins, for the most part this body of work has not subjected the presumption of the material as ontologically different to the same scrutiny, a starting point for STS scholarship.

Given these overlapping but relatively autonomous developments, it seems opportune to convene a small and focused workshop to explore these intersections in more detail. We propose to invite a multi-disciplinary group of scholars – primarily anthropologists, historians, and STS scholars – to discuss the multiple combinations of the material and the social, and, the natural and the man-made, read through the thematic of infrastructure(s).

Among the questions we are keen to explore further in this workshop are:

1. What an STS approach can contribute to the growing scholarship on infrastructures being produced particularly by anthropologists and geographers.

2.   How questions that recur in the new infrastructure scholarship – particularly the urban, the marginal, and the excluded – can influence work being done in STS.

3.   How the study of Asian social and material infrastructures complements and complicates corresponding studies of these systems in other geopolitical settings

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PROGRAMME

DAY ONE		
Session 1		
9:30 – 10:30	Pirate Infrastructures, *Jugaad* Economics: Digital Technologies and Developmental Leap-frogging	Kavita Philip, University of California, Irvine
10:30 – 11:00	TEA	
Session 2		
11:00 – 13:00	The Infrastructural and the Ecological: Politics, Government, and Dwelling in a Thai Railway Settlement	Eli Elinoff, National University of Singapore
	Fuel Infrastructure: The social life of a cooking fuel in Northern Vietnam	Annuska Derks, University of Zurich
13:00 – 14:30	LUNCH	
Session 3		
14:30 – 16:30	Materializing a New Form of Governance: When Streets Building Intersected with State Building in the Early Twentieth-century Canton, China	Zhang Jun, University of Hong Kong
	Infrastructures of Cinema: Understanding Form and Function	Karl Mendonca, University of California, Santa Cruz
Session 4		
16:45 – 17:30	General Discussion of First Day's Papers	

DAY TWO		
Session 5		
9:30 – 10:30	The Long Hydraulic Partition: Infrastructure, Kashmir and the Politics of Scale on the Indus	Majed Akhter, Indiana University
Session 6		
10:30 – 12:30	Mental Blocks: Concrete, Bricks and the Material Politics of Infrastructure in 1970s Tanzania	Emily Brownell, University of Northern Colorado
	Noticing the Materialities of Infrastructure in a Congested Bengaluru	Govind Gopakumar, Concordia University; David Sadoway, Nanyang Technological University
12:30 – 14:00	LUNCH	
14:00 – 16:00	Bombay Time (Colonial City as Assemblage)	Shekhar Krishnan, Homi Bhabha Centre for Science Education
	Infrastructure, Governments, and Fascist Planning: Commentaries on Development from India in the 1930s	Benjamin Zachariah, University of Heidelberg
16:00 – 16:30	TEA	
Session 7		
16:30 – 17:30	Data Centers in Asia: Between Digital Materiality and Global Political Economy	Brett Neilson, University of Western Sydney
Session 8		
17:45 – 18:30	General Discussion of Second Day's Papers	

SESSION 1

Pirate Infrastructures, *Jugaad* Economics: Digital Technologies and Developmental Leap-frogging
Kavita PHILIP
Associate Professor, Department of History (Affiliate Faculty, Anthropology and Informatics), University of California, Irvine

"There's a lot to like about urban poverty," rhapsodizes Harvard economist Howard Glaeser.[1] Counter-culture techno-guru Stewart Brand calls Indian slums "aspirational shantytowns," celebrating the vibrant entrepreneurship found in the midst of precarious infrastructures.

Scholars of Science and Technology Studies have had a longstanding interest in the social life of material things, and we have a considerable body of scholarship in the history, culture, and politics of infrastructure. How might we read the shifting political valencies of the term "infrastructure" alongside the global business discourse about emerging economies?

Urban anthropologists (Matthew Gandy on New York and Nikhil Anand on Mumbai, for instance) have suggested that meaning-making practices in the decaying infrastructures of post-colonial cities show how human subjectivities and techno-spatial materialities are bound up in micro-practices that slip, unnoticed, through the larger grain of political economic analytics. A range of business strategists (most famously C. K. Prahalad) have argued that India's "bottom billion," the people who live and work informally at the bottom of emerging economies practice a form of flexible and inventive problem-solving that makes them the creative center of future capitalist expansion. What political economies and social histories frame this new interest in poor infrastructures and precarious innovation? How do our own academic narratives participate in the projects of a revivifying global capitalism?

In this paper I review the field of postcolonial digital piracy, a growing research area at the intersection of techno-politics, law and infrastructure studies. Piracy in the developing world, as post-colonial media theorists (Ravi Sundaram and Brian Larkin, for example) have shown, re-casts decaying infrastructures and creates flexible new forms of media practice by surfing on the (il)legal knife edges of intellectual property rights.[2] In Science and Technology Studies, important advances in infrastructure theory were developed by feminist scholars (Leigh Star and Lucy Suchman most influentially), investing it with an attention to invisible work and the gendered politics of labour. Yet, STS still under-theorizes the developing world's technological histories. Anticipating the next steps in digital piracy studies, this paper concludes with some reflections on how might we read the perils and promises of infrastructure studies along with the feminist

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[1]   Edward Glaeser, Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, healthier, and Happier (2011). Glaeser's celebration of urban immiseration was widely cited, e.g., in the publicity around his guest appearance on Jon Stewart's Daily Show on February 14, 2011, and in an acerbic   critical overview of this phenomenon by Daniel Brook, "Slumming It: The Gospel of Wealth Comes for Dharavi." The Baffler No. 25, 2014. http://www.thebaffler.com/salvos/slumming-it.
[2]   Abraham, Itty, and van Schendel, Willem, eds. Illicit Flows and Criminal Things States, Borders, and the Other Side of Globalization. Indiana University Press, 2005.

and Marxist analytical legacies that formerly shaped our attention to inequality and power.

SESSION 2

The Infrastructural and the Ecological: Politics, Government, and Dwelling in a Thai Railway Settlement
Eli ELINOFF
Postdoctoral Fellow, Asia Research Institute/Faculty of Arts and Social Sciences, National University of Singapore

How can closer attention to infrastructures help us better understand urban ecologies? In this paper, I explore how the changing fates of the Thai railway align with emerging political claims among squatters who dwell along the railway's tracks. At the end of the 19th century, the Siamese monarchy inaugurated its rail system as part of a strategy that sought to use technology to modernize the kingdom, transforming it into a governable nation-state with a unified "Thai" population. The project not only had effects at the level of the national territory, but also important effects on the local ecologies through which the train traveled. Although the land surrounding the tracks is supposed to a vacant public safety zone, global, national, and local political economies have transformed this vacant space into a densely settled corridor of illegal housing. The narrow spaces along the tracks are packed with both remnants and emerging forms of bio-physical nature; human and non-human life; houses, legal regulations; official and informal infrastructures; experts with ambitious development plans; contentous and competing groups of activist networks; and, increasingly, political struggles rooted in the collisions between these things. I argue that the contemporary disagreements over dwelling taking place on the railway's land reveal how the legacies of these histories are shaping the city's emerging ecological futures. I propose that close attention to the relations between infrastructure, dwelling, politics, and governance offers an important window into urban ecologies, both existing and possible.

Fuel Infrastructure: The social life of a cooking fuel in Northern Vietnam
Annuska DERKS
Assistant Professor, Institute for Social Anthropology and Cultural Studies, University of Zurich

The beehive coal briquette (than tổ ong) is a commonly used cooking fuel that can be found in households and street side food stalls all over northern Vietnam. This paper traces the source of the beehive coal briquette in the coalmines of northern Vietnam. It focuses on coal infrastructure – the coal mines, roads, railways and waterways, processing and storage sites – and what it tells us about the interlinkages between people, things and the environment in the coal briquette chain. In highlighting infrastructure leakage, the paper seeks to explore questions of access, (il)legality and (il)licitness in the world of coal.

SESSION 3

Materializing a New Form of Governance: When Streets Building Intersected with State Building in the Early Twentieth-century Canton, China
Jun, ZHANG
Research Assistant Professor, Hong Kong Institute for the Humanities and Social Sciences, University of Hong Kong

The early twentieth century was a crucial moment for the Chinese cities and the country. The imperial court collapsed, a nation-state gradually took shape, and modern cities emerged. How did a new form of governance become materialized, a form that became conceivable and understandable for ordinary people living with an imperial system for so long? Based on critical reading of historical documents from the then newly established municipal government of Canton, I wish to show that infrastructure projects built the city and the state as much as they built the streets. Drawing on STS literature, this article sheds light on the underestimated material aspect of governance under dramatic transformations. In doing so, it adds complexity to our understanding of infrastructure, which is not only a product of the social and the technological, but also an essential part of a political process full of contingencies and improvisation.

Infrastructures of Cinema: Understanding Form and Function
Karl MENDONCA
PhD Student, Film and Digital Media, Arts Division, University of California, Santa Cruz

There is a significant body of work on Indian cinema that has focused on the textuality of film to engage with a varied range of themes such as national identity (Chakravarty, 1993), spectatorship (Vasudevan, 2011) and urban history (Mazumdar, 2007). In comparison, there has been scarce theoretical attention paid to the material aspects of film production in terms of its infrastructural underpinnings related to distribution. This lacuna points to an opportunity but also highlights a significant challenge for a study of the infrastructure of cinema. Put simply, how might we account for both the operational workings of cinema distribution and the regime of signification signaled by the circulated media forms?

As a working context for such an undertaking, this paper will "follow the action" out of the cinema hall and present a case study of Blaze Advertising, a 70-year old network in India that held a monopoly on the distribution of cinema intermission advertising between the 1960's and the 1980's. The network had its beginnings in Bombay when journalist Mohan Bijlani and his business partner Freni Variava pioneered print advertising on the back of theater passes for the film Mughal-e-Azam (1960). Their company, Blaze Advertising, expanded the types of cinema advertising to slides and films that were played during the intermission, establishing a monopoly on distribution to cinemas across India. The story takes an unexpected turn, when in 1986, Blaze Advertising's monopoly was disrupted by the Government of India and the network was repurposed into a courier company (similar to FedEx). While this transformation is remarkable in itself, it is important to note that the courier company used the same distributive infrastructure as its previous avataar. This raises several questions about how such a shift was made possible, but also introduces another media form: the digital web site that is used to track the status of courier packages. Given that the project is still in its

early stages of research, this paper will focus on situating the case study within the broader field of infrastructure studies and outline possible hermeneutic approaches that can bring questions of representation and political economy together.

SESSION 5

The Long Hydraulic Partition: Infrastructure, Kashmir and the Politics of Scale on the Indus
Majed AKHTER
Assistant Professor, Department of Geography, Indiana University

This paper draws on Marxist-geographic theories of scale to analyze the historical dialectic between rivers, large infrastructures, and state/nation formation. Through an analysis of historical and contemporary disputes between India and Pakistan over the Indus Rivers in Kashmir, I show that the watershed, the downstream region, and national territory are mutually constitutive and often contradictory scalar projects mediated through the planning, contestation, and construction of large river infrastructure projects. The paper puts critical geography in conversation with technology studies and post-humanist thought to highlight how projects of political territorialization in the Indus basin co-evolve with other scalar projects, with river infrastructures providing a key mediating link between different scalar projects.

Seeing rivers, states, and infrastructures in this new light allows critical intervention into policy discussions and historiographical debates. I suggest that the so-called "water security crisis" on the Indus, which revolves around geopolitical tension between upstream India and downstream Pakistan, is best understood as an unfinished "long hydraulic partition" of South Asia. Vazira Zamindar argues in The Long Partition (2010) that the emergence of India and Pakistan should not be understood as a discrete event, but as a process that lasted well into the 1950s as property laws, identities, rights to immobile property, and the policing of territorial boundaries adjusted to newly drawn borders. I push Zamindar's provocative formulation by suggesting that we are stilling dealing with the political geographic contradictions of the partition of the Indian subcontinent in 1947. Thus an insistence on seeing Indus hydropolitics as inextricable from the dispute between Pakistan and India over the territory of Kashmir is crucial to my approach. Although there is a longstanding practice on the part of state and international state elites to keep the highly politicized territorial dispute of Kashmir separate from the ostensibly apolitical and technical Indus waters dispute, my argument is that both disputes are discrete moments of an inter-connected, contradictory, and on-going historical process.

SESSION 6

Mental Blocks: Concrete, Bricks and the Material Politics of Infrastructure in 1970s Tanzania
Emily BROWNELL
Assistant Professor of History, University of Northern Colorado
Visiting Scholar, Max Planck Institute for the History of Science

This paper explores the public debate regarding building materials that emerged during the socialist era in Tanzania. Whether Tanzanians should be building with bricks or concrete became a recurring conversation in newspapers as well as the subject of several university studies during the 1970s. This debate focused on what the materials offered in terms of technology, modernity and national identity. There were also conversations about what concrete and bricks would each be most useful for and who should be making and using each of them. The nature of conversations regarding these materials stretched from the initial sites and tools of production of each to how well they would endure over time as edifices and infrastructures.

I also situate this particular Tanzanian conversation within the larger context of debates about infrastructure materials for the 'Third World' and what these conversations reflected about larger discourses on 'big' and 'small' development.

Noticing the Materialities of Infrastructure in a Congested Bengaluru
Govind GOPAKUMAR
Associate Professor and Associate Chair, Centre for Engineering in Society, Faculty of Engineering and Computer Science, Concordia University

David SADOWAY
Postdoctoral Fellow, Division of Sociology, Nanyang Technological University

Infrastructures are profoundly mass-ive yet banal configurations of the social, natural, technical, and organizational that mediate vital flows constituting our modern and urban lives. The banality of infrastructures, for urban anthropologists and geographers, becomes a cover for all kinds of unscrutinized interests, (dis)alignments, and "power geometries" (Graham and Marvin 2001) packaged within its routine operations and expressed through socio-spatial arrangements such as "splintering urbanism" (ibid), enclavization, place-making, etc. It is this assumed banality that these social studies of infrastructures have sought to challenge through a critical engagement with infrastructures. In doing so, we argue, the 'mass-iveness' or materiality of infrastructures has received far less scrutiny. One means of addressing this lacuna is by developing and designing a visual analytics for representing and comprehending the 'massiveness' of infrastructures. Relying on 'scapes' – a concept derived from landscape and mobility studies – we articulate infrastructurescape as a spatio-material visual analytics of infrastructures. We are convinced that while a sociospatial analysis does address the exclusionary modes of intervention one witnesses in Bengaluru, it does not quite grasp how a materially-infused landscape embodies particular kinds of infrastructural temperaments and sensibilities that support their manifestation. Visually representing these infrastructurescapes represents one of the core means we adopt in this paper. Through our visual studies, we seek to draw attention to the spatio-material dimensions

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of the current 're-wiring' and 're-imagining' of Bengaluru urban space. Our analytics suggests that these sometimes troubling transformations become visible through specific modalities, such as disconnections, (dis)placements, flows/blockages, or boundaries. By visually describing these various configurations we articulate how attending to the 'massiveness' of infrastructures can shed important light on the constitution of contemporary cities in India that might otherwise have remained unseen.

Bombay Time (Colonial City as Assemblage)
Shekhar KRISHNAN
Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research (TIFR), Mumbai

The theory of the "global city" originally described urban centres such as New York, London and Tokyo as key nodes in the flows of global capital, whose management demands the concentration of financial technologies and producer services. Much like these contemporary hubs, the port cities of British India were nodes in imperial networks of command and control which extended across South Asia and the Indian Ocean. Sociologists have used the language of "flows" and "networks" to describe the connectivity of world cities, while geographers have drawn attention to the fragmented and "splintered" nature of urban environments and technologies, and how the global "space of flows" is always in tension with the local "space of places".

Colonial Bombay developed as a metropolis both within and against empire. The completion of oceanic and transcontinental networks of communication and transportation across India and the Empire by the 18701880s made possible the coordination and transmission of time signals both inside and outside the city. However, the effort to standardise time confronted a multitude of visible and audible temporal signs in the urban environment – public clocks, factory sirens, office shifts, railway timetables, sunlight and sunset. "Railway Time" on the longitude of Madras – fixed on the completion of the transcontinental railway link in the 1870s – encountered quiet public resistance in Bombay, for whom the new standard time was more than half an hour ahead of local solar time.

By the turn of the century, these disjunct transformations unleashed in the effort to construct a disembedded "market society" in Bombay would encounter much wider resistance within the lifeworlds and human economy of the rapidly growing urban population. Despite repeated attempts to secure uniformity by colonial scientists and officials, a patchwork of time standards soon resulted from rival claims to longitudinal determination offered by the railways, ports and observatories, and persistent defiance of these standards by religious and civic leaders, traders, workers and who maintained what became known as "Bombay Time" – a 3039 minute delay from official "Indian Standard Time" (IST). The promulgation of IST by Lord Curzon in 19056 prompted widespread nationalist protests, from stoning of clocks to strikes by office employees and factory workers. Municipal nationalist politicians took their side in the midst of the first "swadeshi" agitations against British rule. Bombay Time was thereafter observed as an insignia of native difference and everyday resistance – for clerks and employees in foreign firms to turn up late and leave early from work; for bankers and brokers to remain open for trading later than European commercial banks and exchanges; and for

native philanthropists and civic leaders to sponsor public clocks 3039 minutes behind IST.

This early nationalist form of urban protest dramatised disruptions to seasonal and daily rhythms of work and labour, previously oriented and valued on the basis of tasks and not time. A parallel change was already underway in the vectors and circuits of money – as the moral economy of precolonial markets and their diversity of exchange instruments was replaced by long-distance commerce and state-issued currency based on metallic standards – and of space – as a bundle of overlapping rights, customary uses, and chains of title measured by fertility yielded to an urban land market whose values were determined by their absolute area or central location.

The colonial city and its infrastructure was neither simply a physical container nor discursive stage, but a complex sociotechnical assemblage, in which games of language and number revealed that colonial power was often most insecure in its urban centres of command and control. The scale and path dependencies of industrialisation and globalisation require new ways of thinking through the production of urban space in Asia. Large-scale urbanisation in colonial Bombay did not arise from a preordained narrative, but was the outcome of strategic attempts by urban elites to resist their subordination within new financial, industrial and spatial hierarchies, marrying the technologies of global imperialism to the incipient language of Indian nationalism.

Infrastructure, Governments, and Fascist Planning: Commentaries on Development from India in the 1930s
Benjamin ZACHARIAH
Research Fellow, Karl Jaspers Centre for Advanced Transcultural Studies, University of Heidelberg

The formula 'socialism' was important as legitimation for an Indian conception of development and for the conception of a future state in India after the anticipated end of colonial rule. However, the term gave away nothing much of the content it implied, making it a normative category without descriptive bite. At the same time, as 'planning' became the catchphrase for departures from the idealised non-interventionist economies of capitalism and imperialism before the First World War, it was important to understand the interventionist economies of Fascist Italy, the New Deal, and Nazi Germany as potential alternative models. My talk examines discussions in Indian public domains on what infrastructure governments under capitalism, and under fascism, ought to provide, and to what extent these could be construed as socialist, including the possibilities of a 'national' socialist model. These discussions hinged on the question of infrastructure, or what we in retrospect would call infrastructure: what states ought to do to assist private capital, juxtaposed against what states should do to control an economy: arguments hostile as well as supportive of capitalist models of the economy agreed on this distinction.

SESSION 7

Data Centers in Asia: Between Digital Materiality and Global Political Economy
Brett NEILSON
Research Director, Institute for Culture and Society
Professor, School of Humanities and Communications Art, University of Western
Sydney

Otherwise known as server farms, data centres are box-like architectural facilities that accommodate computer and network systems that store, process and transfer digital information in high volume at fast speeds. These infrastructural installations have become nerve centers of the global economy, creating new forms of power and competitive advantage through peering exchange agreements that enable the physical interconnection of separate, private electronic networks. Focusing on the spread of data centers in the Asia-Pacific region, this paper asks what kind of research object a data center is. Mapping the regional concentration of data centers in Hong Kong, Singapore and Taiwan, I explore the relevance of such clustering with respect to the rise of cloud infrastructures in China. Topics engaged include the positioning of data centers in wider urban and global spatial economies, the political and social realities encountered in the technical design and operations of these facilities, the diverse clients and industries invested in data centers, the terrestrial and undersea fiber optic networks to which they connect, and the economic significance of low latency communication. From this empirical base some tentative theoretical and methodological proposals about how to study data centers will emerge. In particular, I will ask how, aside from their technical and social dimensions, data centers generate ambient conditions that become part of their political effect. Moreover, I will explore the importance of an approach that emphasizes the networked materiality of these infrastructures staying in touch with geopolitical and political economic analyses that take seriously the category of capital.