(Re)Prioritizing Citizens in Smart Cities Governance: Examples of Smart Citizenship from Urban India

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AREN'T CITIES AND CITIZENS ALREADY SMART?

"Smart People has been identified as critical for Smart Cities"'
- extract from IEEE-CCD White Paper (De Obeso-Orendain et al., 2014)

The corporate-led and commercially-driven process of urban planning and visioning for 'Smart Cities' prompts us to ask whether city-regions already possess latent intelligence 'in their DNA' so to speak. That is: haven't cities as the historical nexus of socio-cultural, technical and economic gravitas long been endowed with adaptive capacities and don't residents already exhibit the necessary systemic smarts to operate and govern their cities? Or, we inquire: what makes a city-region that heavily employs any given technology necessarily any smarter than a 'low tech' city, or even a strategically conceived 'slow city'?[1]

As the quote above from a recent White Paper on Smart Cities suggests (Obeso-Orendain et al., 2014), despite the seeming best intentions of informatics scholars and professionals, the discussion about ICT-linked urbanization often takes on technologically deterministic or even Darwinian tones. This is evidenced by the suggestion above that 'Smart People' represent seeming inputs 'critical[ly]' required for the smooth functioning of the 'Smart City'. By contrast, our research situates the Smart Cities agenda in relation to socio-technological processes that have historically splintered, divided or deepened urban wealth, class, caste or information divisions and other forms of spatial segregation. This resonates with Graham & Marvin's (2001), 'splintering urbanism' thesis; and more recently, Hollands' (2008) and others' critiques of Smart Cities (Greenfield, 2013; Agyeman & McLean, 2014). Such critiques suggests that ICTs and supporting infrastructures can entrench existing urban asymmetries by fueling elitism, exclusion or enclaves (e.g. spatio-digital divides; premium network space formation; creation of private scanscapes; 24/7 e-machiadoras; and other forms of atomized citizenship).

We are interested in this research note in tagging alternatives to the commercially shaped Smart City. Our argument for Smart Citizenship is specifically tied to the work of the civic-cyber non-profit action-research group, *Transparent Chennai*, operating in the rapidly changing south Indian urban-region of Chennai with its 8.7 million plus inhabitants.[2] In the limited space herein, we seek to address two research questions: How can we better distinguish between commercially-shaped and community-driven approaches in urban ICT praxis? And via what possible 'smart' processes might citizens reassert or reinsert their voices and visions in urban planning and governance?

Facial and spatial recognition vs. recognizing *citizen intelligence*

In the post-Wikileaks and post-Snowden era it has become apparent that urban digital networks and ICTs ought not to be seen as neutral, banal, benign or external, hidden infrastructures - but rather as power webs that play a vital role in the co-construction of our daily lives and urban polity. The rise of the networked society, networked cities and networked governance associated with ICTs (Castells, 2008), including fixed and mobile technologies and the ever-expanding 'internet of things' has driven a persistent interest in 'Smart Cities' (Townsend, 2013, 3). The combination of growing global urbanization and a rise in ubiquitous computing, according to Pierce et al., (2013, 69), suggests that 'each time cities expand, advances in information technology have kept pace to manage their ever-expanding complexity.' As a result urban planning praxis has also had to keep pace. The interpenetration of the virtual and physical has spawned a range of literature which outlines the seeming merits of ICT-linked urban planning and infrastructure initiatives under the rubric of 'smart' or 'intelligent' cities (e.g. Santinha & Castro, 2010; Chourabi et al., 2012; Frost & Sullivan, 2013; Townsend, 2013; Tomer & Puentes, 2014; De Obeso-Orendain et al., 2014).

Commercially-driven 'Smart Cities' priorities - focused on providing solutions to customers and returns to shareholders - have arguably ignored the historical lessons of 'wicked problems' (Rittel & Webber, 1973) that are tied to technological quick fixes or technologically deterministic plan-making as pathways to better city living (Mandelbaum, 1996; Graham & Marvin, 2001). For example, issues about civic space, individual privacy and the right to control or manage public infrastructures and data have grown in tandem with the rise of ubiquitous urban informatics (Crang & Graham, 2007; Nissenbaum & Varnelis, 2012; Datoo, 2014). Crang and Graham (2007) aptly describe this phenomenon as 'sentient cities', suggesting that: 'it is a world where we not only think of cities, but cities think of us, where the environment reflexively monitors our behaviour' (ibid., 789).The 'data and metadata' generated in this informational entanglement raises serious transparency, privacy, surveillance and public sphere contestations as 'ubiquitious informational overlays' interpenetrate urban spaces (Nissenbaum & Varnelis, 2012, 30). Before discussing possible Smart Citizen

alternatives to these conundrums we first examine the constructed concept of Smart Cities.

Smart Cities - definitions and contestations

Pierce et al. (2013, 70) attribute the use of the term 'Smart Cities' to the late architect William Mitchell, founder of the Smart Cities research group at MIT's Media Lab (also see: Allwinkle & Cruikshank 2011, 4) - and later reinforced by IBM's 2008 'smarter cities' marketing campaign (Pierce et al., ibid.). The term has also been related to different policy domains, such as 'smart growth' (which seeks to balance urban population and economic growth with land use and ecological / energy constraints); and 'smart grids' (which seeks to more efficiently distribute energy supplies to networker users' demands, such as amongst intermittent renewable energy sources).

Townsend (2013, 15) defines the smart city as: 'places where information technology is combined with infrastructure, architecture, everyday objects, and even our bodies to address social, economic, and environmental problems.' Santinha and Castro (2010) identify the challenges of labeling and defining smart or intelligent cities and suggests that at minimum that they need to have a 'coherent framework and a unified methodology for the design and implementation of its intelligence' (ibid., 79) (also see: Chourabi et al., 2012). Notably, Hollands' (2008, 314) work has identified both the problematic open-ended definition of 'Smart Cities,' along with the fact that this ill-defined concept has been narrowly employed in the 'more limited political agenda of high-tech urban entrepreneurialism.'

To date Smart Cities modes of urban governance have clearly been shaped and steered by large and influential commercial players in hardware, software and infrastructure sectors - such as IBM, General Electric, Cisco Systems, Hitachi and Siemens, amongst others (IBM Global Services, 2011; Siemens AG, 2011; Frost & Sullivan, 2013; Hitachi, 2013; Townsend, 2013). The Japanese ICT firm Hitachi, in a commissioned study, defines Smart Cities as: 'an evolved state of urbanization where [the] application of technology integrates diverse individual entities such as buildings, utilities, authorities, infrastructure and industries' (Frost & Sullivan, 2013, 2). The same study goes on to identify the potential market opportunities in Smart Cities, as follows:

"To target cities as a customer and to tap the vast business opportunities it presents, companies need to internally revamp their in-house competencies and products/service portfolio. The global city infrastructure market is expected to provide $2.2 trillion market opportunities in 2025" (ibid.).

The focus of 'Smart Cities' research for governments has typically been on how cities might improve urban economies, quality of life and myriad problems by employing an often techno-deterministic outlook on the uses of ICTs. These have involved the growing role of commercial activities and joint ventures, including: firms injecting themselves as 'stakeholders' in governmental tendering and public consultation processes; Smart Cities strategic networking (e.g. conference sponsorships or participation); public-private partnership projects in urban planning and digital infrastructure provisioning (i.e. ICT-linked urban planning consulting inside city halls and government ministries); as well as in massive direct investments in Smart Cities and 'green' high tech city demonstration projects (e.g. New Songdo, Korea; or Masdar, Abu Dhabi-UAE).

The excessive utopian and techo-deterministic claims about ICT uptake and uses in cities; and the tendency of governments (or advisory 'champions' and 'thought leaders') to valorize commercial or market interests in the shaping of the Smart Cities discourse has clearly been identified by urban studies researchers (Crang & Graham, 2007; Hollands, 2008; Gibbs et al., 2013; Greenfield, 2013; Agyeman & McLean, 2014; Staffans & Horelli, 2014). For example, Greenfield (2013) critiques the promotional language of ICT manufacturers and marketers (in relation to Smart Cities) and their frequent perfectionist or utopian visions (vs. messy urban realities). He suggests that the municipal governments - which are the typical target markets for 'Smart Citification' - need to remain cautious towards the claims of Smart City advocates.

Smart Cities coming soon to India

Our case study of Transparent Chennai (TC) is situated in the context of the recent intensive policy push by the Government of India to rapidly develop over 100 Smart Cities across the nation following the election of Narendra Modi and his BJP coalition cohorts in 2014 (Government of India, 2014; *The Economic Times*, 2014). Notably, the CEO of Cisco Systems was identified, as being keenly interested in these initiatives. According to a government official, 'the company [Cisco] also wants to partner [with] India in setting up Smart Cities' (*The Economic Times*, 2014). The Indian official also suggested that: 'according to them [Cisco], the company is involved in Smart Cities that are successful in the world' (ibid.). Besides working on information technology master plans in two pilot cities in Gujarat and Maharashtra, Cisco Systems also has partnered in India with the private sector Delhi-Mumbai Industrial Corridor Development Company (Strickland, 2012), amongst other involvements.[3] Clearly global ICT firms like Cisco Systems have a more than singular global region or city-region in mind in relation to their Smart Cities commercialization agenda.

Not all has been dazzling, however, when it comes to rolling out smart urbanity in India. An example from Townsend's (2013) study identifies the unintended consequences of ICT deployment. The example involves e-governance in the Indian 'Bhoomi' initiative - a World Bank supported project in Karnataka - which sought to digitally track land ownership and was also intended to eliminate local corruption. Instead the digital approach apparently had the unintended effect of encouraging land speculation by enabling the efficient and speedy private monopolizing of land holdings in the fast growing Bangalore (Bengaluru) city-region (through rapid access to land records in a newly centralized digital clearinghouse) (ibid., 13). This cautionary example highlights the important need to scrutinize the unintended consequences of ICT-linked approaches in shaping urban futures. The next section compares corporate-driven modes of Smart Cities governance and urban planning with those of Smart Citizenship.

TOWARDS A 'SMART CITIZENSHIP' FRAMEWORK

In our discussion above about the current definition of Smart Cities, we have identified several key concerns about commercial and corporate-driven modes of e-governance and urban e-planning. In this section we elaborate upon the contrasts between existing Smart Cities approaches and our 'Smart Citizenship' framework. Later in the section we cite several examples from the work of the Indian non-profit action-research group, Transparent Chennai, which are cited as potential exemplars for kick-starting local-oriented Smart Citizenship processes elsewhere.

Smart Citizenship - local uses of ICTs for addressing local needs

A Smart Citizenship approach is *not* a call for a shift to neo-luddite cities, nor is it a vision of a Khmer Rouge-like demand for urban abandonment, but rather it is a call for engaged, active and critically reflective civic-cyber debates and deeper discourses among a diversity of citizens - and not only the visions of digitally dominant 'thought' or 'business leaders.' Civic-cyber dialogue and debate, we suggest, needs to address ICT praxis in relation to local needs and it also needs to address questions about technological control, choices and trajectories - particularly in relation to ICT uptake, deployment and designs by residents.

Advocates of do-it-yourself (DIY) approaches, hackathons and fabrication labs (fablabs) and so forth, have argued that without the building blocks of open ICT infrastructures and platforms for 'smart citizens' (Townsend, 2013; Diez, 2014) - including 'open access', 'open source software' and 'net neutrality' - that the construction of the Smart City and its social economy will be highly unlikely. This matches our suggestion that Smart Citizenship need to involve not only engineers, coders or systems scientists - but also civic hacktivists, local associations and

longstanding community groups that make up civic-cyber space (e.g. Sadoway, 2012, 2013).

Missing from the typical analysis of Smart Cities, we suggest, has been an identification of the importance of urban community informatics insights as well as an explicit recognition of not novel, but longstanding institutional models (that are now hybridizing alongside the rise of ICTs) including: non-profits, social enterprises, various types of co-operatives, credit unions, foundations and stakeholder or community-owned or controlled enterprises, as well as traditional civic associations. We suggest that Smart Citizenship should not simply represent a form of 'crowd sourcing' or a digital 'sharing economy.' Instead civic-cyber life needs to draw lessons from urban planning traditions that emphasize deep and meaningful civic engagement or community control in questions about local urban planning and design (e.g. Sandercock, 2003; Friedmann, 2010; Coehlo, et al., 2013).

Smart Citizenship is a call for respecting what has been termed 'local/traditional knowledge systems' (Standley et al., 2009). And it is a call for focusing on 'citizen science' (Paulos et al., 2009); as well as for considering community informatics approaches, exemplified by: Schuler's (2001) work on 'civic intelligence'; Gurstein's (2014) discussions on 'smart communities'; and Agyman and McLean's (2014) notion of 'sharing cities'. The common thread in these concepts is that technologies need to serve and work for people and communities first in terms of their design and deployment, but also in relation to setting local civic and infrastructural priorities. The checks and balances against the rise of a dystopian invasive digital surveillance society or unaccountable forms of commercialized techno-utopianism, we suggest, underscores a need to recognize the importance of pre-existing civic organizations and civic intelligence amongst urban residents. Civic intelligence, suggests Schuler (ibid., 166), is not embedded (or even necessarily enhanced through the uses of ICTs), but instead is latent in collective, conscious civic action and reflection - and it represents: 'the ability of humankind to use information and communication in order to engage in collective problem solving' (ibid.). Notably, critics like Hollands (2008, 315) emphasize that Smart Cities have to: 'start with people […] rather than blindly believing that ICT itself can automatically transform and improve cities.'

A basic binary model - Smart Cities vs. Smart Citizenship

The distinction we make between 'Smart Cities' and 'Smart Citizenship' can be crystallized in a basic contrasting binary model - which distinguishes between a top-down, commercially driven, low degree of civic-cyber engagement agenda (i.e. a pro-commercial or corporate-state entangled digital agenda), versus a bottom-up, high degree of civic-cyber engagement in a community-driven ICT agenda (i.e. a community-controlled or pro-civic digital agenda). These simplified 'ideal-type'

contrasts - essentially, poles on a continuum of ICT praxis and choices in city-regions - are shown in Table 1. This matrix clearly associates current Smart Cities approaches with forms of tokenism or even manipulative civic e-engagement (particularly in modes of urban governance). We take this position so as to provoke and elicit the articulation of informatics alternatives that seek to envision more than profit or monetary motivations as forces in driving ICT-linked urban innovations.

Table 1: A *Smart Cities approach* compared to a *Smart Citizenship approach* (authors)

Comparative Dimensions	*Smart Cities* Approach	*Smart Citizenship* Approach
Mode of urban governance	ICT-linked interests are closely involved in lobbying, marketing, consulting / advising, public relations and project advocacy typically for 'world class' megaprojects or infrastructures	ICT-linked interests negotiate with civic leadership in a transparent public environment through 'client relations' and local needs are addressed through work with / for community and civic groups
Mode of civic engagement	ICT-linked civic engagement involves forms of citizen tokenism, public relations, marketing and / or polling exercises; civic priorities are shaped by centralized or tightly managed political power plays	ICT-linked civic engagement is shaped by decentralized citizen-driven forums and discourses, including the steering of civic-cyber initiatives (which are nurtured through existing face-to-face engagement processes and institutions)
Mode of urban infrastructure provisioning	ICT urban infrastructure provisions are shaped by private-public partnerships (core risks assumed by the public sector) as well as with premium network services for exclusive enclaves, special economic zones, showcase projects; and 'trickle down' effects	ICT urban infrastructure provisions are shaped by principles of universal and affordable 'access for all', digital openness and the Internet is treated as a 'public utility' with support for: open access, net neutrality, civic privacy and ICT-related education, training and digital libraries, etc.
Mode of managing civic space	ICT provisions and access are associated with accepted 'losses of privacy' (personal and public sphere) due to justified needs for corporate tracking / profiling and state infringements on digital privacy due to security concerns	ICT provisions and access are publicly debated including how novel technological advances shapes rights to: free speech, association, civic dissent, information privacy / tracking and protection against state or private corporate / commercial intrusions
Mode of managing urban livability	ICTs are employed for environmental innovations, efficiency and profit-making tools or platforms; sustainability or livability advances are an additional bonus from efficiency, and profit-making priorities	ICTs are employed with a focus on supporting existing local environmental work and quality of life issues, including: eco-justice, air quality, water, soil, light or noise pollution (along with 'global-local' issues like climate change)

These distinctions serve to bring out comparisons between Smart Cities and Smart Citizenship across five distinct dimensions or modalities: governance, civic participation, infrastructure, civic space and urban livability. Jessop (2002, 460) suggests that 'ideal types' - such as our contrasting model - serve less as normative ideals than they do as 'thought experiments' that can support comparative analysis. Our very basic comparison here not only suggests distinctions between degrees of civic engagement as well as how and to what purposes ICTs are being employed, but

it also provides a working framework for examining the case of Transparent Chennai (TC) later in this research note. Townsend (2013, 15) also reminds us that we need to consider the key question: 'what do you want a smart city to be?' This highlights the importance of examining how and why cities are shaping technologies to suit their needs and the need for civic inclusiveness in this process.

Our framework for Smart Citizenship therefore focuses on the existing 'civic intelligence' (Schuler, 2001) inside communities, neighborhoods and local institutions (whether digital or non-digital). Such approaches first seek to understand and emphasize local civic priorities and needs - rather than prioritizing the needs of commercial technology players, state PR campaigns or memes of the day (Hollands, 2008, 315). For example, community informatics approaches applied to urban planning provides a rich strand of ideas for envisioning multiple modes and opportunities for participation, co-learning and challenging traditional approaches to civic engagement in urban governance and planning (e.g. Hudson-Smith et al., 2002; Horelli, 2013; Steffans & Horelli, 2014).

Clearly then, a diverse array of civic-cyber arenas can serve as alternatives to traditional top-down public or public-private modes of civic engagement. A Smart Citizenship approach can provide a complementary check on inappropriate state or corporate Smart Cities interventions not only in ICT-linked applications and emergent infrastructures - but also in day-to-day urban planning and governance. The TC example exhibits some of these traits because it has been organized as a non-profit action-research entity and because it works both with community groups and neighbourhoods as well as with governments and state-agencies. The next section of our paper further explores the concept of 'Smart Citizenship' in relation to the case of Transparent Chennai.

Transparent Chennai: An exemplar of smart citizenship?

In the case of Transparent Chennai - whose action-research is largely centred in India's fourth largest city-region of Chennai (in the southern state of Tamil Nadu) - we are interested in examining how its work relates to Smart Citizenship and how it may be invoking civic or community intelligence and local knowledge in relation to ICT-linked urban governance and non-digitally mediated community planning praxis.[4]

Transparent Chennai is a Chennai-based non-profit group - affiliated as a project within the Centre for Development Finance (an Indian research centre in the Institute of Financial Management and Research) - that was initiated in 2009-10 by Nithya Raman and a team of multi-disciplinary researchers with a focus on urban action research in areas as diverse as: solid waste management, water, slums and informal settlements, pedestrian infrastructures / road safety, public toilets and sanitation,

multi-level infrastructure financing, heritage conservation, electoral accountability and city governance (www.transparentchennai.com).[5]

We are particularly interested in how TC's approach may or may not contrast with existing Smart Cities visions. We suggest that the distinct practices of TC arguably have little to do with the contrasting utopian visions of stand-alone Smart Cities, Special Economic Zones, or ICT Science Parks that some observers have identified in relation to novel claims on 'world class' urbanism in India (Shaban, 2013; Sadoway & Gopakumar, forthcoming). We are also interested in understanding how TC's work might align with 'Smart Citizenship' approaches because of their role as researcher-activists working closely with local communities and neighbourhoods (and governments) and in shaping technologies for local public engagement in urban governance and planning actions.

TC's interdisciplinary team of researchers (up to 15 researchers) have shaped its role as a public information intermediary and a digital clearinghouse by collecting, processing and mapping key data and research on what it perceives to be neglected or underrepresented issues in Chennai. Although in recent times its work has involved direct collaborations with the urban metropolitan government - known in India as the Urban Local Body (in this case, the Corporation of Chennai)[6] - TC primarily (and originally) focused its activities on direct ties to grassroots working class and middle class residents and does so through a variety of means such as community survey and mapping efforts. The importance of employing civic-cyber data and interactions is emphasized in its mission:

"Transparent Chennai hopes that bringing data to light about important civic issues like road safety will help bring more attention to under-recognized city problems, and help to empower citizens to hold the government accountable for making improvements. Transparent Chennai creates maps, data, and research on civic issues to empower citizens and increase government accountability" (www.transparentchennai.com).

Illustrative of Transparent Chennai's interest in tapping into community energy to prioritize civic concerns, the organization actively solicits interested publics to co-create potentially transformative civic 'information.' For example its website (TC website, 2014) suggests that: 'Residents of Chennai who are interested in civic issues are encouraged to log onto www.transparentchennai.com and join the movement to create information for change.' Not only has TC insisted on working with local residents to better define local problems (through face-to-face surveys and meetings or interviews in neighbourhoods); it has also sought to challenge local government agencies and officials to improve local infrastructure provisions in Chennai. A TC staffer, highlights this approach as follows:

"The poor quality of existing city level data, and the unwillingness of city agencies to use this data to allocate resources, means that even the limited existing public services fail to reach the needy. The lesson for Indian cities from our research in Chennai is that if city managers are serious about improving equity, efficiency and accountability in service provision, a prerequisite is that infrastructure decisions be based on rich public data that captures ground realities" (Somya Sethuraman, www.transparentchennai.com).

In the sections below we elaborate on how Transparent Chennai attempts to develop digitally driven approaches for addressing critical urban problems about urban infrastructures and services. Two priorities that TC has opted to focus upon in Chennai, amongst many others, include ICT-linked approaches to highlight the need for public toilets and sanitation; as well as to understand neighbourhood pedestrian infrastructure and road safety issues. The next two sections respectively examines these two areas where TC seeks to 'capture ground realities' by employing ICTs in the civic interest.

TC's work on public toilets & urban sanitation

One of the key issues that TC has taken on board in its ICT-related urban advocacy work has been gathering and disseminating data about public toilets and sanitation provisions - including through the use of its open source online mapping service. Rather than serving as a digital app or map that provides location-based information about toilets in various parts of the city, the purpose of TC's work has been to instead focus the energies of government and public officials onto deficiencies in the access to public toilets and sanitation, particularly in poorer communities of Chennai (Transparent Chennai, 2011, 2013a,c).

In recent years TC has developed expertise in researching questions about urban toilets and sanitation as part of its broader focus on urban infrastructure provisions for grassroots citizens and local neighbourhoods. Besides mapping, surveying and 'collecting data on the number and location of public toilets in the city,' TC has focused on the day-to-day operations of the public toilet as a public service, as described below:

"We also attempt to understand the roles and responsibilities of the various government officials, departments and boards in constructing, maintaining and operating a toilet. This gives us data on how public toilets are planned and sanctioned; and on whom to hold accountable when they stop working. [...] We also look at the governance of underground sewerage networks, the means through which they are planned and built, and the means through which people access sanitation in the city"

(www.transparentchennai.com)

Notably, there has apparently been a high level commitment by India's recently elected BJP-Modi Central government to build 'a toilet in every household' (Shrinivasan, 2014; Joshi, 2014). However, in rapidly urbanizing India, the politics of urban sanitation and human excreta, as in much of the Southern world, has long been a seemingly very low priority of governments (e.g. Rockefeller, 1998; *Deccan Herald*, 16 July 2013). Expensive, energy intensive and centralized design-build networked pipe and sewage treatment plant solutions (often touted by foreign donors) have been advocated by governments and private infrastructure boosters - including in the most recent wave of multi-level government financed design-build infrastructures in India (Dasgupta, 2013, pers.comm., 18 April; Rohilla, 2013, pers.comm., 29 March). However, according to these same experts, little work or interest has been directed to the provision of basic access to safe, clean and environmentally friendly community-based sanitation facilities. TCs work on community sanitation and toilet provisions has affirmed this point. For example, their surveys, interviews and right to information (RTI) requests to government in 2011 identified only 714 public access toilets for serving the approximately 8-10 million persons who reside in Chennai - with a significant number of these facilities being poorly located, improperly functioning or ill-maintained (Transparent Chennai, 2011; Sethuraman, 2012).

Indian sanitation activists working with Transparent Chennai have also attempted to prioritize the importance of women's safety - affirmed in current international comparative research on the importance of safe access to sanitation for women. For example, a recent paper by Swedish WaterAid (Gosling et al., 2014), 'Nowhere to go: How a lack of safe toilets threatens to increase violence against women in slums' links the issue of inadequate access to sanitation in urban slums with the issue of women's safety. In the case of Chennai, TC's research into sanitation and toilets was initially prompted via its engagements with informal sector women workers (providing inputs into Chennai's 2009 City Development Plan) and who emphasized a 'need for public toilets at workplaces such as market areas, bus stops, and in under-serviced slum areas' (Transparent Chennai 2011, 1).[7] TC's subsequent Chennai studies, which included highly granular local level surveys and digital mapping work - and mediated using TC's online Geographic Information System (GIS) maps - found that because toilets were not conveniently located they remained underutilized and therefore were identified by government as being unwanted and thus unnecessary (Sethuraman, 2012).[8]

Besides physical issues - such as hygiene, lighting, safety, unclear opening times, absent caretakers, and discretionary user charges - TC's research found that Chennai governmental management of toilets had poorly defined lines of accountability with a mix of various agencies involved and low budgetary allocations. Illustrative of TC's

approach to civic advocacy their multi-scalar survey work on toilets in Chennai was synthesized in a GIS formatted map at the district level indicating 56 global positioning system (GPS) identified toilets - thus serving as a practical tool for visually identifying sanitary deficiencies in various neighborhoods in the city (Transparent Chennai, 2013a,c). TC's sanitation approach has helped highlight deficiencies in infrastructure provisions and has also been linked to the effectiveness of ward or local level officials and politicos - thus injecting transparency and urban governance issues in their work.

TC's digitally pooled toilet and sanitation data and maps are located in publicly accessible online reports (e.g. Figure 1); and their research findings have also been mobilized in a user-friendly online clearinghouse that encourages residents to aggregate and visualize datasets by building their own GIS-derived maps - by including data layers like the 'toilet deficiencies,' noted above.[9] These publicly accessible online maps are available to become another layer in a multi-layered and growing public data project - and the many projects that TC has become involved with. The toilet projects fits into its broader vision of enabling access to meaningful data about urban infrastructure needs and priorities typically identified or advocated by and for Chennai citizens. As with their work on advocating for public toilets, TC has built upon citizens' informal knowledge and stated priorities in order to create information and support improvements in a very different set of civic infrastructures and services, as the next section discusses.

Mapping of existing toilets from memory (orange) and physical survey (green)

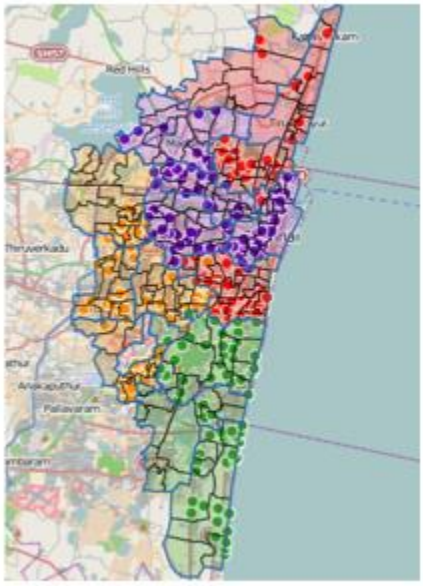
Physical survey: 348 locations were feasible

Figure 1: An example of TC's work on surveying and digitally mapping basic toilet services in Chennai neighbourhoods (Image: Transparent Chennai, 2014)

TC's pro-pedestrian work in an increasingly urban car culture

In July 2013, the Chennai-based newspaper, *The Hindu*, launched a month-long pro-pedestrian rights campaign dubbed, '*Right to Walk'* which set out to, 'focu[s] on the right of Chennai's residents to a safe and healthy city' (Varadarajan, 2013). Seeking to catalyze solutions for Chennai publics and policymakers - and in Indian cities overall - the newspaper posited that:

"The absence of usable footpaths was a significant contributor to the over 100 pedestrian deaths in Chennai in 2012, as per NCRB data. Few of us ever walk on pavements often because they have been encroached upon or are simply non-existent. The Right to Walk aims to reclaim our city's footpaths for pedestrians through a targeted print and online campaign that will empower residents and goad local officials to act" (Varadarajan, 2013).

Part of the force generated in this Right to Walk (RTW) campaign was that it was linked to questions about 'the right to the city' tied to mobility, accessibility and motility (or the right to mobility). Similarly, in its efforts to raise the awareness of pedestrian issues in Chennai, TC played a role in *The Hindu*'s RTW campaign - largely as an information clearinghouse and visualization medium (through its GIS work) by linking to its local surveys, mapping and identified residents' concerns about local neighbourhood pedestrian and road traffic safety (Figure 2).

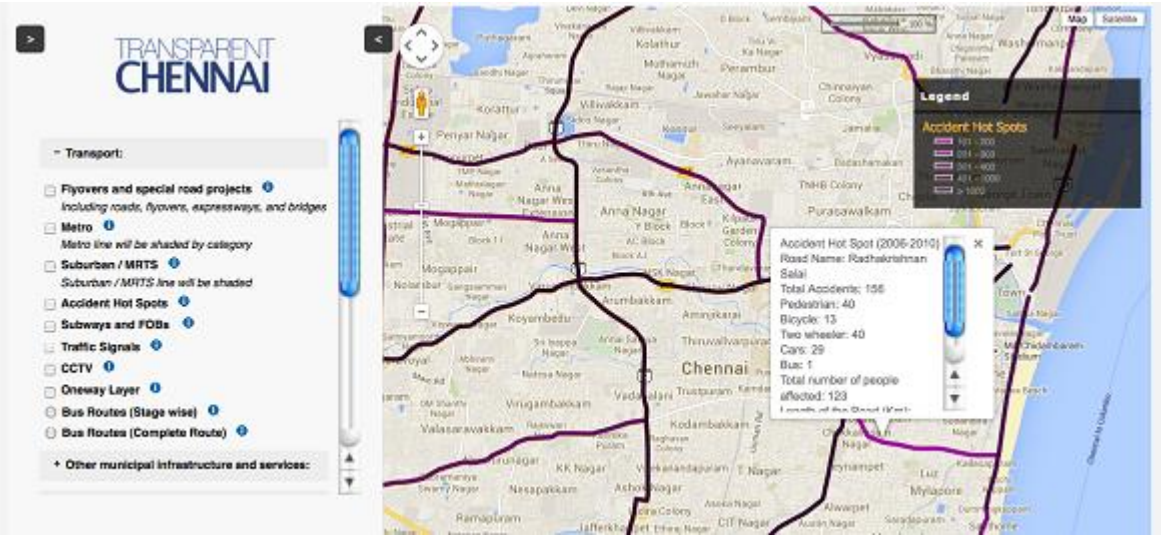

Figure 2: An example of Transparent Chennai's transport safety GIS mapping. Public data for accident hot spots and types of accidents can be shown as layers along selected roads in Chennai neighbourhoods (Image: Transparent Chennai, 2014).

TC also, for example, hosts on its online GIS the option for layers mapping that encourages residents to flag and comment on or update the status of expensive infrastructure projects that contribute to urban automobility - such as highway flyovers - and their changing timelines or cost escalations. This approach relates to TC's clear interest in public transparency issues that have in recent years become paramount in scrutinizing expensive public works projects - as for example those of the automobile oriented infrastructures in Chennai. Similarly, RTW campaigners also identified the issue of rising automobile oriented infrastructure subsidies 'given to motorists by carving up the right of way, and depriving other classes of users of their fair share'(Ananthakrishnan, 2013d), to underscore the social and environmental justice ramifications and lock-in effects of public road infrastructure plans and projects.[10]

Figure 3: An example of a Transparent Chennai interactive urban design workshop for identifying local issues using community-mapping and design feedback approaches (K.K. Nagar neighbourhood, Chennai) (Photo: Transparent Chennai, 2014).

The RTW and TC campaigns also underscore the ongoing public health threats facing most urban pedestrians through 'rising vehicular traffic, noise, pollution and gridlock' (Ananthakrishnan, 2013c). Both the RTW and TC's regular reports identified the harsh realities of being a pedestrian in Chennai - and common throughout most large Indian cities - including: a wide range of roadside traffic dangers; women's safety issues (Shivam, 2013); unusable and broken sidewalks; sidewalk rights of way covered with construction debris; and encroachments on sidewalks by businesses and households (Lopez, 2013).[11]

TC's work also has acknowledged the near impossibility of mobility for Chennai residents with physical disabilities - including their need for: universal design accessibility; barrier free walkways; and markers for the visually impaired. Problems reported by differently-abled activists included: sidewalk, curb and other height variations: improper walkway or cuts (or transitions) and the myriad hurdles or obstructions facing residents (Kannan, 2013). Reports in the media have also identified the severe safety challenges facing cyclists in Chennai (Srivathshan, 2013b). Along the same lines Transparent Chennai starting in 2013, has combined public participation with the use of ICTs in working with four Chennai neighbourhoods to highlight the inadequacies in the city's pedestrian infrastructure - and also to work with communities to articulate how these situations might be improved. For example, TC has served as an anchor organization working with a Chennai NGO the Traffic and Transport Forum (TTF) and the Nanganallur neighbourhood (located near Chennai's international airport) to address safety and pedestrian related infrastructure issues (TC forthcoming). Working with TTF and local residents TC established relations with the Nanganallur community and organized community meetings that involved the public, local councilors, students, merchants / vendors and the media, amongst others.

TC's approach to addressing pedestrian issues - as with its work on public toilets - has involved detailed surveying and mapping to understand the local pedestrian context, including collecting information on: 'walkability, pedestrian-vehicular conflict, maintenance and cleanliness, roads, amenities, safety and security, disability infrastructure, land-use, obstructions, parking, motorist behaviour, bus stop locations and drainage' (TC, forthcoming). TC surveyors collected local pedestrian planning data were in turn geo-referenced (into GIS formats) and basic maps were subsequently developed for community analyses, discussions and report writing. Besides identifying crucial issues about pedestrian design and its impacts on local street vendors, key local issues - such as street lighting, vegetation, parking, bus access and garbage dumping - were identified in their community-based research efforts. Employing the maps and survey data a participatory interactive design workshop was organized (first in July 2013 and involving ~50 residents) in order to prioritize key local pedestrian issues and solicit design suggestions. TC has employed similar community face-to-face workshop and community mapping approaches to solicit ideas and seek feedback on local priorities (Figure 3; Figure 4).

In the case of the Nanganallur neighbourhood design discussions, feedback was also provided by the community - via a July 2013 workshop and a follow-up January 2014 meeting - focused on a local road redesign that sought to nominally improve local pedestrian safety. Employing a 3D physical street model to elicit further community feedback, TC subsequently took the pedestrian infrastructure (re)design plan to

Chennai's Mayor and Joint Commissioner, the head of the public works department, who agreed to implement this and therefore address stated community needs (TC forthcoming).

The pedestrian and public health issues noted in the TC and RTW work relates to walkability, livability and infrastructure futures that are issues in much of urban India, as others have suggested (e.g. Sanyal et al., 2010).[12] Clearly local infrastructural choices - whether investing in widening roadways for enhanced automobility; or choosing instead to improve local urban walkability and safety - will not only impact current traffic patterns, but also will shape public health and livability for future urban residents.

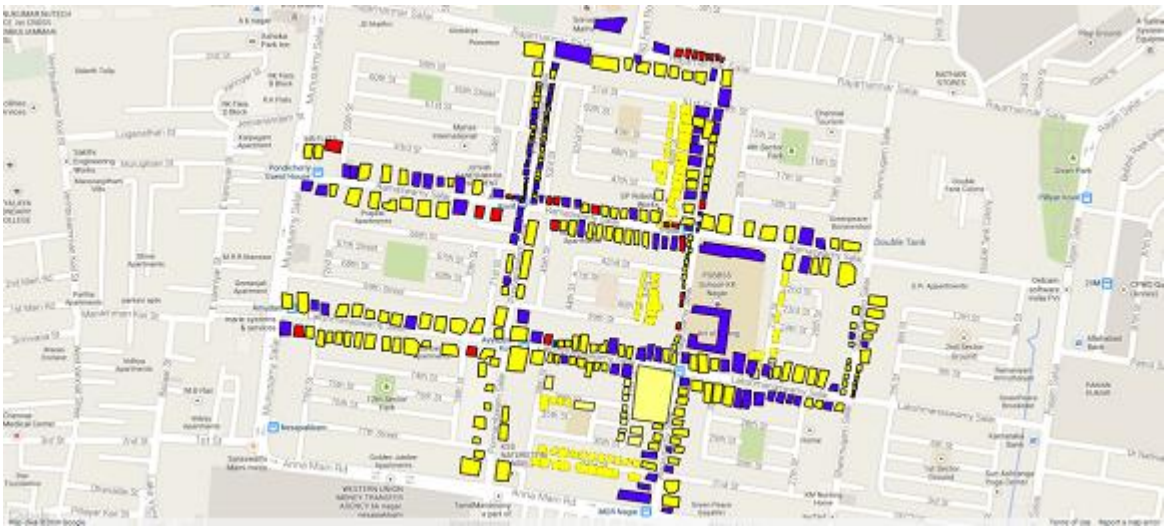

Figure 4: An example of Transparent Chennai's neighbourhood-level mapping and survey analyses to identify local road, traffic and pedestrian safety issues (K.K. Nagar neighbourhood, Chennai) (Image: Transparent Chennai, 2014).

Civic networked governance

Besides the politics of infrastructural choice - as identified in TC's report and map-making on the pedestrian and public toilets - two key issues can be identified. The first - and a recurring issue in urban India - has been the obvious gaps between state-sanctioned and funded infrastructure plans, programming and projects and *actual citizen or resident needs on the ground* (or the street). A second issue, stemming from the Chennai experience, is the complex, multiple (or polycentric) agency overlaps and coordination challenges involving infrastructure issues, including the need for addressing tangible, street-level concerns. Both the toilet and pedestrian examples from TC's projects and campaigns suggest that local infrastructural contestations need to be traced in relation not only to the critical grounded issues (i.e. the street), but also

in relation to the linked programs, plans, human resources and funding, emanating from multiple 'centres of calculation' (i.e. the business or government 'suite').

TC employs ICTs as a bridge or platform for connecting residents and governments as a basis for advocating for infrastructure and service improvements. Collectively TC's approaches link to fundamental issues of accountability, transparency, and civic engagement issues; and in turn to the ever-changing nature of urban governance. The examples noted demonstrate how TCs work has emphasized the importance of locally grounded issues in neighbourhoods. Its ICT-linked mapping work also illustrates an approach for linking highly localized (and sometimes polarized) issues, needs and concerns to broader city-region issues. This bottom-up approach, we suggest, contrasts significantly with Smart Cities approaches which posit that high-level technological expertise is most able to provide ready-made solutions to communities. The concluding section discusses these contrasts further.

CONCLUSION: *SMARTER* CITIZENSHIP, WISER CITIES

By exploring the concept of 'Smart Citizenship' our work sought to augment existing community informatics concepts - such as work on 'civic intelligence' (Schuler 2001); 'smart communities' or 'ICT-enabled communities' (Gurstein 2014); 'wiser cities' (Staffans & Horelli 2014); and 'sharing cities' (Agymen & McLean 2014) - since these support enabling or enhancing collective forms of local knowledge and the wisdom embedded in local communities, movements, associations, organizations and urban neighbourhoods.

Our research has also sought to emphasize the key contestations underlying the commercially dominated idea of Smart Cities. For example, in response to our first research question at the beginning of this discussion - of distinguishing between commercial and community-based approaches to urban ICT praxis - we devised a binary model for framing and analyzing Smart Citizenship. Notably, Smart Citizenship - the place-based knowledge and wisdom inherent in communities and neighbourhoods - was contrasted with Smart Cities as a distinct approach in relation to urban governance, civic participation, infrastructure, civic space and urban livability.

In response to our second research question about how citizens might 'reassert or reinsert their voices and visions' in ICT-linked urban planning and governance, we examined the work of Transparent Chennai (TC). Our research found that the TC exemplar demonstrates a potential for 'smarter' more engaged and transparent governmentality - and its approach to community mapping and public advocacy arguably represent one of many possible approaches for addressing threats from the commercialized Smart Cities agenda. The examples of TC's work also suggests that

ICT-linked solutions, as illustrated in the context of Chennai, ought to tangibly address local social, environmental and economic needs and injustices. TC's approach involves focusing on community-defined infrastructure needs and priorities - such as poor access to public toilets or the growing threat from automobility to pedestrian safety and the urban quality of life.

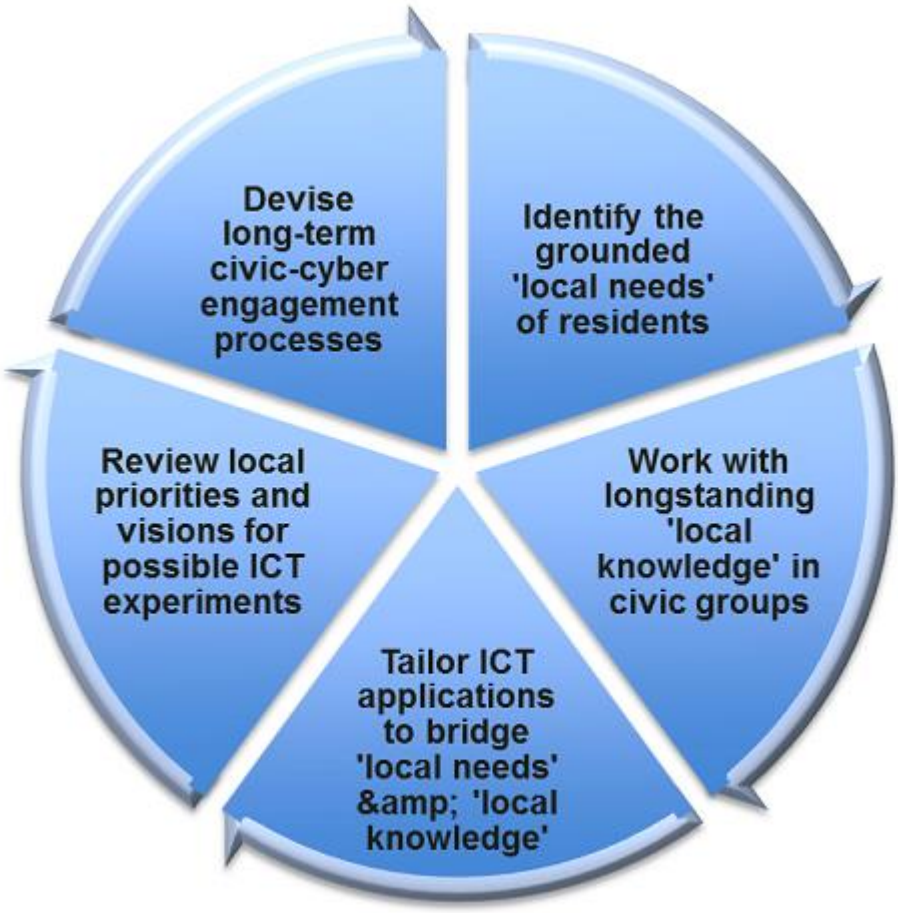

Figure 5: A generalized Smart Citizenship civic-cyber engagement process (authors)

Rather than re-engineering cities and citizens, reprioritize local needs

A Smart Citizenship framework situates citizens, civic organizations and participatory processes as drivers or steering devices for ICT-linked applications and praxis. Our discussion on Smart Cities highlights the need for more complex civic-cyber intelligence systems. And this is not only in relation to the perpetual quest for 'better technological solutions' - but also for seeking more basic democratic and equitable approaches that are capable of prioritizing local civic knowledge and needs along with addressing political accountability and civic decision-making processes which in turn respect community knowledge and needs. As discussed earlier, we need to reiterate that ICT-linked approaches should not be understood as a singular 'silver bullet'

solution to complex urban challenges, but rather they may be an element and potentially play a part in reframing urban challenges. As in the TC case this may involve community-mapping and GIS projects; as well as using ICTs as vehicles for eliciting local input from neighbourhoods along with being a bridge for building credibility with local officials and politicos in local government.

TC's distinct method of operations involves approaches that work in and with local communities - while also addressing political power and governance issues - and they involved *both* face-to-face and virtual modes. This suggests a nominal approach or process that sees the residents as 'smart' rather than simply as digital inputs, tools or platforms (or seeing the ICT tools as 'smartest'). In such a Smart Citizenship process ICTs are used to augment, complement and support, rather than drive or propel civic engagement processes, potentially at various critical points of civic engagement, as Figure 5 suggests. TC also is unique in that it works with both government and residents, something neither traditional civic advocates nor the commercially-driven technology industry does, at least in Chennai. While the TC approach indirectly challenges the concept of a Smart City, its choice of focusing on local and informal issues also gets to the heart of who is considered a citizen or resident by the state. It is this approach that situates TC as central in the debate about Smart Cities versus *Smarter* Citizenship.

Finally, we have argued that it remains important to question the headlong rush to implement 'Smart' initiatives, plans and programming on the part of elected leaders, urban planners and city administrators. These debates will, in the long run, establish not only who gathers the benefits of public infrastructure policies and expenditures, but also they will shape the very nature of urban citizenship and city governance. If socio-economic stability and urban livability issues are purported to be central values underlying urban governance then steering technological advances to first address local neighbourhood needs - rather than those of unelected corporate firms - needs to remain central in a Smart Citizenship agenda. We also rhetorically asked the question earlier 'aren't cities and citizens already smart?' in the hopes of provoking an imaginary of what might constitute Smarter Citizenship and the appropriate technological (as well as non-technological) responses that might better support and enhance civic life.

Postscript

Governments around the world, certainly in India, are being pressured to improve transparency and accountability, and to use ICT to improve public administration - to be 'smart'. However, governments lack the high quality data that is necessary and citizens, too, lack the capacity to create data they need to advocate for their own needs. and to hold the government accountable for providing basic services.

Moreover, because laws and programs dealing with the urban poor often ignore the informal, these communities fall into a legal grey area, one in which residents are unaware of their rights and entitlements, and governments are able to simply ignore their existence, or worse, to exercise force over them with impunity. As a result, interactions between the local government (elected representatives or local bureaucrats) and residents have remained individualized and transactional, dependent on bribes and "influence" rather than on entitlements backed by clear procedures for access.

This gap in information is particularly important to address now because there has been a push towards using ICT to be data driven in their governance in many Indian cities, one that is being influenced by the technology industry. Without advances in data collection methods and participatory processes that enable both governments and residents to create credible information about informal populations, cities risk excluding these residents from their planning entirely. Such risks are present not just in Indian cities, but in cities with large informal populations all over the world. In response to this context, a core group of researchers from Transparent Chennai propose the establishment of the Transparent Cities Network (TCN), an organization that will be able to respond to demands for data and research that can improve both advocacy and decision-making on issues facing the urban poor, particularly in situations of high informality. The group's vision for the Transparent Cities Network is to create cities that are responsive to the needs of the poorest through the use of maps, data, and information technology.

According to its founding members, "TCN will be an organization that will be able to respond to demands for data and research that can improve both advocacy and decision-making on issues facing the urban poor, particularly in situations of high informality. The TCN will: (1) be a laboratory for data collection tools and methodologies for citizen engagement that can address information gaps on issues facing the urban poor; (2) act as a support organization for civil society organizations and government entities that want to improve their ability to use data, mapping, and participation to increase access to basic services and tenure security for city residents; and (3) establish a network of practitioners and advocates who share practical, context-specific, and effective strategies to create more transparent and inclusive cities.

The activities of the TCN are designed to allow us to foster a shared understanding of one important problem facing planners and advocates trying to improve conditions for the urban poor, namely the lack of information for planning and accountability. They also allow us to develop tools for planning, participation, and data collection to address these data gaps, and to build awareness among and advise government and civil society organizations about their use and effectiveness. Essentially, our goal is to

begin articulating a new form of planning practice for Indian cities, one which responds to the local context of high levels of poverty and informality. These activities also include work in the city of Chennai, but rather than looking at this intervention as the sole focus of our work, we have recast it as a laboratory for effective interventions, from which information and communication technology tools, methods, and strategies can be distilled for use in other contexts. As such, much of our resources will go towards not just towards the interventions themselves, but also towards refining methods (including producing teaching materials), evaluating the effectiveness of these methods, documenting processes, and sharing lessons. In the future, interventions could expand to other cities, either by setting up projects executed in partnership with local organizations or by setting up other offices of the TCN locally."

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ENDNOTES

[1] For analyses of the urban design and spatio-political aspects of the 'Cittàslow' (slow cities) movement, see: Knox (2005) and Miele (2008).
[2] The population figure for Chennai, the fourth largest metro in India, is drawn from the Census Organization of India (2011) (Available at: http://www.census2011.co.in/city.php. Last accessed 23 November 2014).
[3] Along with its investment the flagship role model smart city project at Songdo, Korea, Cisco Systems has also invested funds into four 'global innovation hubs' that are intended to serve as centres for 'thought leadership and experiment [that] will bring together start-ups, technology and service partners, academia and customers to rethink and transform the status-quo' (Grant, 2014).
[4] Our methods employ presentations notes and slides from the April 2014 Shastri-Indo Canadian Institute Symposium (held at the Madras Institute of Development Studies, Chennai); a review of Smart Cities, civic engagement and community informatics literatures; and we draw upon one of the author's digital archives of Chennai and Smart Cities-related media stories. We also cite (publicly accessible) reports on sanitation / toilets, pedestrian issues and urban governance available on the Transparent Chennai website (www.transparentchennai.com).
[5] Between 2010-2014, TC received funding and technical support from various groups, including: Google Foundation, Ford Foundation, The Asia Foundation, Shakti

Foundation, Rockefeller Foundation (Forum for the Future), Transparency and Accountability Initiative, International Development Research Centre; and World Wide Web Foundation.

[6] In February 2014 TC signed a two-year memorandum of understanding with the Corporation of Chennai (CoC) to create the first city-level data portal in India. The focus of this collaboration is to develop in-house capacities for comprehensive data management, including collection, storage, publishing, analysis and data use; and these approaches will employ a variety of ICT and non-ICT tools and methodologies 'to leverage the latent knowledge held by city engineers and officials.'

[7]Transparent Chennai's (2011) work in this instance involved collecting number and location data for public toilets in the city from municipal government and zonal / borough offices; and it also included separate Right to Information (RTI) requests and distinct interviews each of the 10 zonal offices. TC focused on toilets in a single city zone and identified basic quality parameters including: 'presence of lights, water, electricity, structural integrity, cleanliness, [etc.]' And TC undertook 'interviews with users and the caretaker at each toilet' (ibid.). In addition, 'each toilet location was geo-referenced using GPS units, and close-up photographs of the amenities inside each toilet were taken' (ibid.).

[8]For example, data accessed by TC from the Tamil Nadu Slum Clearance Board revealed that access to toilet conditions was far worse in 'undeclared slums' in Chennai - where against the norm of 1 toilet seat per 60 persons in other areas of the City, the reality was 1 toilet seat per 1,056 persons in undeclared slums.

[9]TC's 'toilet' map layer function is available at: http://www.transparentchennai.com/buildamap/.

[10]In 2007, according to the RTW campaigners, 28% of the trips in major cities were made by walking and 45% of India's 246 million households owned bicycles (although the proportion of 'in city' bike trips reduced from 33% in 1994 to 11% in 2007) (Srivathshan, 2013b). Similar data were noted in a WWF report (Sanyal et al., 2010, 8) which identified in a 2008 study cities of over 8 million that 22% employed walking trips, 8% bicycle trips; and 44% public transportation trips. The 74% non-auto users (walking, bike and transport trips), it was suggested, would also rely on walking as a 'last mile option' during at final part of their journeys (Ibid).

[11] For example, one of the RTW campaign reports noted that: 'The walkability index for Indian cities, a parameter that measures the availability of pavements and facilities, is as low as 0.5 (an index value of 1 indicates a good network). In comparison, cities such as London have a high index value of 1.7' (Ministry of Urban Development [2008] as reported in Srivathshan (2013b).

[12] For example a 2010 study commissioned by WWF India (Sanyal et al., 2010) highlighted the importance of 'walkability' as a central urban design paradigm (along with density and public transport). The study found that transportation (and infrastructural) choices would shape future Indian urban morphologies (forms and

densities) in tandem with energy, carbon, water and waste footprints. Notably the report's authors suggest that: 'walking is a form of transportation that is entirely neglected by urban planners in India even though a majority of Indian city-dwellers walk all or part of their journeys' (Ibid., 8).

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